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ABSTRACT

Within a program of training system evaluation, optimal training system development cannot occur without evaluation development, and evaluation cannot be very effective in the absence of an optimal approach to training system development. Therefore, the goal of the Community Affairs Training Evaluation (CATE) project was to develop a set of procedures which provide practical information to decision makers for making program decisions and judging goal attainment. The result has been the development of a prototype for a Decision Oriented Evaluation System (DOES), involving evaluations of the training procedures and materials, the trainee's job performance, and the community impact of the program, to be done in three stages: the input stage, the process stage, and the outcome stage. A prototype user's handbook has been developed and will allow the pilot testing revision, field testing, extension, and development of a supporting training system which are necessary before a comprehensive installation can be made. (Author/BW)

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FINAL REPORT

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Project CATE

Final Report

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Research and Development Center for Teacher Education
The University of Texas at Austin
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COMMUNITY AFFAIRS TRAINING EVALUATION

Project CATE: Phase I Final Report

Project Staff

Richard C. Wallace, Principle Investigator
William F. Dossett, Project Director
Donald B. Witzke
Donald [illegible]. Smith
Brad A. Manning
in collaboration with
Jay Farrington, Consultant

Prepared For

The Office of Education, Information, and Training
State of Texas Department of Community Affairs

By

The Research and Development Center for Teacher Education
The University of Texas at Austin

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PART I

Introduction

Modes of Evaluation

Project Activities

Search and Analysis

Introduction

Background

The development and execution of state-wide training programs require well informed decision-making in order to maximize effectiveness in reaching program goals. The Texas Department of Community Affairs (TDCA) has recognized this need for itself and has expressed the concern for decision-making capabilities based on sound program evaluation for national, state, and local levels also. To assist TDCA in developing evaluation capabilities, the Community Affairs Training Evaluation (CATE) project was funded through an interagency agreement between TDCA and the University of Texas under a grant from the Department of Housing and Urban Development to be conducted by the Research and Development Center for Teacher Education at the University. The goal of the CATE project has been to provide TDCA with an evaluation system that can be used to judge the effectiveness of their training programs. More specifically, the project effort has been to perform the necessary research in the area of training evaluation and bring these findings to bear on developing a system that would assist TDCA to gauge the effectiveness of training, to examine the improvement of job performance as a function of training, and to investigate ways of determining impact of the community as a result of training.

Most people have fairly clear ideas of the concepts and operations of training. Much less clearer notions are held about evaluation. Indeed, the least clear understanding exists regarding the relationship between training and evaluation and how closely these two operations are bound to each other. To get full measure from available resources, the trainer and evaluator must share perspectives. Optimal training system development cannot occur without evaluation development, and evaluation cannot be very effective in the absence of an optimal approach to training system development. Training development and evaluation cannot be divorced from each other without degrading both. What is needed then is a unified systems approach to both training and evaluation. An approach is needed that provides the context to understand the relationships that exist between the parameters of training and those of evaluation.

The requirement of the system is to provide a unified set of procedures which will give decision-makers the information they need to determine answers to the following questions about their training program efforts:

1. What kind of impact are training programs having on community development?
2. Do the training programs improve the confidence and competence of the people they train?
3. Are funding agencies getting adequate return for their investment?

The effort of this project has been directed toward providing decision-makers with information related to the above questions. The principle guiding the project has been to see evaluation as the process of identifying, obtaining, and using information to judge decision alternatives. From this definition of evaluation the CATE project's goal has been to develop a set of procedures which provide practical information to decision-makers for making program decisions and judging goal attainment. The result at the end of this contract year has been the development of a prototype for a Decision Oriented Evaluation System (DOES). The overall system design has been completed and elements of the system have been developed and pilot tested. The total system development is rather far from final completion and will require more pilot testing revision, field testing, extension and the development of a supporting training system before comprehensive installation can be made. However, a prototype user's handbook has been developed and will allow a trial installation of DOES at TDCA in the summer of 1973 during which many of the field test questions can be answered, and extension of the system can be made to TDCA's environment. During this time development of a supporting system for installation and training will be inaugurated with TDCA.

DOES identifies three modes of evaluation. Each of these modes is concerned with providing evaluative information related to specific program efforts.

Mode 1: Training. Evaluation in Mode 1 is applied to determine the quality of training and training materials *per se*, and is concerned with assessing skill development and the acquisition of confidence by trainees. Thus, evaluation is designed to determine whether the trainee can perform the tasks for which he has been prepared.

Mode 2: Performance. The purpose of evaluation in this mode is to assess the effects of training upon the overall job performance of the trainee once he has returned to his position. Here evaluation will provide information on specific application of skills developed during training, and whether the trainee has personally profited from his training.

Mode 3: Community Impact. Mode 3 evaluation is concerned with tracing the impact of training upon community development. Information supplied within this mode will relate to community benefits, systems effectiveness, responsiveness, service effectiveness and leadership development.

An evaluation system focusing on these three modes used by decision-makers at the federal and state levels will assist program coordinators in:

- --setting guidelines for evaluation contracting
- --judging the quality of evaluation contracts
- --assessing the effectiveness of training programs
- --assessing the quality of training programs
- --tracing the effects of transfer of training to job performance and community development
- --providing guidelines for instructional training materials development.

In addition, local decision-makers will use evaluation system outcomes to make decisions about programs and training appropriate for their communities.

Decision-makers at all levels need procedures for translating evaluative information into a format which is practical for use by personnel untrained in evaluation. Therefore, the system will call for evaluative information to be presented to the decision-maker in the following form:

1. A one-page decision abstract which will include the following information:
    a. How good is the program (training activity)?
    b. What does it cost?
    c. How dependable are the data?
    d. What inferences can be made?
    e. What recommendations can be made for action or decision?
2. A four to six page abstract summarizing the technical report.
3. A full technical report of the results of the study.

General Approach

In conceptualizing and designing the system, the project staff has drawn on several major resource areas: modern educational evaluation theory and research, research in instructional systems design, training and evaluation development and applications in the military and private industry sectors, and industrial psychology. A massive amount of literature in these areas was gathered by the project's search and analysis team and analyzed by the staff. To obtain greater insight on developments and applications of training and evaluation methodologies, project teams visited numerous private industry, civil government, and military organizations. In addition, several CATE workshops (including two retreats) plus joint meetings of the CATE project and TDCA staffs were held to share concepts and findings and to modify developmental directions. Concepts and information gathered from the literature survey and from site visits were analyzed and fed back on the original design configuration to evolve the system design shown in Figure 1.

After the search and analysis and system design phases were well underway, development of specific evaluation instrumentation was begun. The major objective was to develop and pilot test instruments for the three evaluation modes of training, job performance, and community impact. Two training activities were selected as targets for pilot testing. These were supervision training and training for housing maintenance personnel. The supervisor training course was developed by the Engineering Extension Division at Texas A&M and was used for pilot testing training evaluation mode. The housing maintenance course was developed jointly by San Antonio College and the San Antonio Housing Authority and was selected for pilot testing instrumentation for job performance measurement and community impact observation.

Ancillary to training evaluation was the development of a set of ratable criteria for the evaluation of training course materials constituting the training package being offered by the developer. Thus, the development of four different types of evaluation instruments was projected: training materials evaluation, training process evaluation, job performance measurement, and community impact observation. In addition to these evaluation instruments, the project undertook the development of two sets of criterial guidelines for sub-contracting: (1) the development of training activities and (2) the evaluation of training.

Rationale for Proceeding in Each Mode of Evaluation

In order to answer the questions regarding the impact of training programs on community development, the extent to which training programs improve the competence and confidence and job performance of trainees, and in order to provide federal, state and local agencies with information regarding the return on their investment in training, we have proposed a three mode evaluation system. Evaluation is defined as the process of identifying, obtaining and using information to judge decision alternatives.

The DOES evaluation system identifies three modes of evaluation. Mode 1 is entitled Training Evaluation. Evaluation within this mode is concerned with the prerequisites for training, effective training procedures and with skill and knowledge acquisition by trainees. Essentially, training evaluation is directed toward determining whether or not trainees can perform the tasks for which the training has been designed. The second mode of evaluation is called Job Performance Measurement. The purpose of this mode of evaluation is to assess the transfer effects of training to on-the-job performance of the trainees. The third mode is termed Community Impact Evaluation. This mode of evaluation attempts to trace or observe the effects of training on community indicators. That is, it attempts to answer the question "Are there any observable community benefits which can be related in some way to training as that training has improved the job performance of individuals within local government?"

It should be made clear that community impact evaluation is a very difficult field. First, it is a new field of inquiry in social science research and little is known about it. A second difficulty is the fact that an enormous complex of variables are dynamically interacting within a community; in most cases, attempts to isolate the effects of specific training or variables within that larger dynamic context will be very difficult, if at all possible, from an evaluation methodology perspective. Indeed if community impact evaluation can be conducted at all, it will probably have to be done through indirect community measures rather than direct measures. The most useful data sources are likely to emerge from changes or trends in information elicited as part of the natural process record within a community be it local, state or national.

The job performance evaluation system is a natural outgrowth of training evaluation. In this regard, decision makers ask the important question "Did training actually change the on-the-job performance of individuals trained?" Job performance evaluation is difficult unless the training and the job include specific observable behaviors or work products that can be rated against an external criterion. Even then, the judgment of quality becomes a rather difficult issue, from a methodological perspective.

Training evaluation per se is perhaps the easiest of the three modes of evaluation. Even here, however, training evaluation can function effectively only to the extent to which very specific goals have been established for training, specific objectives can be derived from those goals, and specific observable behaviors can be specified as a function of training. Unless these conditions are met it will be *exceedingly difficult to judge the effect of training and to conduct training evaluation.* In summary then the rationale for proceeding in three modes of evaluation is to ascertain whether training is producing the results intended, to determine if there is any influence on job performance as a function of training, and to determine if any changes in community life can be observed and in some way related to training.

Stages of Evaluation Within Each Mode

In order to operationalize the three *modes* of evaluation it is necessary to add another dimension to the system. That dimension refers to the developmental *stages* of evaluation that must be operationalized within each mode. The stages of evaluation are *input stage*, *process stage*, *outcome stage*.

The input stage refers to the gathering of data and information prerequisite to the execution of both the process and outcome stages. The input stage is somewhat like the process of establishing readiness for a learning activity. Unless these input stage activities are conducted, within each mode, process and outcome evaluation stages cannot be conducted effectively and the entire evaluation process will fail, in all probability. An examination of the components of the DOES system (see Handbook) will show that each mode of evaluation requires specific information for the input stage.

The process stage of evaluation within each mode refers to those activities which take place while training evaluation, job performance measurement and community impact observation are in operation. The major objectives of the process stage of evaluation are: 1) to determine the observable consistency of training activities, job performance observation and monitoring of community data with the stated objectives and goals; 2) to gather and feedback information to participants, developers and sponsors regarding the effectiveness of training, job performance and community observation; 3) to verify the training activities, job performance measurements and community impact indicators are congruent with the needs, objectives and outcomes specified in the input evaluation stage.

The outcome evaluation stage refers to a set of procedures employed to gather information relative to the success of the effort within each mode. The outcome stage of evaluation is concerned then with the effectiveness of a training program in meeting its intermediate and its ultimate objectives, with the transfer of training to job performance and with the observation of improvement of quality of service in a community as a function of training intervention.

In summary, the input stage of evaluation provides the background for proceeding in each of the three modes of evaluation. The process stage of evaluation specifies those kinds of data to be gathered when the system is "in motion." The outcome stage of evaluation is concerned with gathering data relative to effectiveness. Outcome evaluation can be thought of in terms of payoff; that is, what returns are being realized for the investment in training: 1) in and of itself; 2) in terms of increasing the job performance of trainees; 3) with respect to producing observable changes in the community.

Summary

The three modes and three stages of evaluation provide the conceptual and operational framework for DOES. The modes of evaluation represent the three areas of interest to the Texas Department of Community Affairs (TDCA) and the Housing and Urban Development (HUD). The stages of evaluation represent the activities that evaluators must undertake to provide the type of answers that TDCA and HUD seek.

Rationale for Training Package Evaluation and Criteria

The evaluation of training is very closely related to the development and/or the evaluation of training materials. In most cases the quality of training will bear a direct relationship to the quality of the training materials used. Therefore, the project staff developed criteria to rate training packages for potential use in community development training programs. These criteria would then be used to generate guidelines for subcontracting the development of training materials; the criteria would also be used to generate the evaluation model. The criteria are included in this report and in the Handbook.

Major Project Activities

Of the many, varied tasks necessary to the design of a unified evaluation system, a few project activities warrant a brief recounting. The following activities produced important results for our system of evaluating training.

(1) Initial Planning and Search Activities. For the first several months, the project's personnel were occupied principally with two tasks, project planning and search and analysis. With the assistance of all members of the staff, the planning specialist designed a Time Related Activity Chart (TRAC) which projected and integrated all tasks necessary to timely completion of the system. The search and analysis team collected and analyzed information related to training and evaluation of training at the managerial-supervisory level. At first members of the team interviewed directors of state, military and industrial training programs and collected training packages, manuals and materials. Their activities then focused on library resources that would widen the range of materials and permit specific examination of the actual processes of training, job performance and community impact.

(2) The Sheraton-Crest Conference. The project team conceptualized the preliminary design of its evaluation system at a week-long conference at the Austin Sheraton Crest Inn. As outlined there, DOES provides three levels of information for evaluators and decision-makers:

a. A system design for training evaluation to be used by professional evaluators.

b. Guidelines for developing training programs and for subcontracting evaluation; criteria for judging the quality of training development and evaluation.

c. Decision memos for training evaluation in three modes.

(3) The DOES Brochure. A mid-term progress report furthered the conceptualization of DOES. At the request of the project's sponsor, the staff produced a ten page prospectus, which required a more thorough understanding of the evaluation system and its role in the training, evaluation and decision process. The resulting brochure effectively communicated the system's overall design to decision-makers in the sponsoring agency.

(4) Site Visits. Members of the staff supplemented their search of printed sources with visits to training and evaluation specialists and decision-makers in the military, government and industry. For example, research of the training mode was supplemented by visits to Southwestern Bell, Texas A&M, San Antonio College and the San Antonio Housing Authority. Because the Air Force is expecially effective at both training and job performance evaluation, project members visited the Air Training Command at Randolph Air Force Base and both the Personnel Research Division and the Occupational Measurement Squadron at Lackland Air Force Base. The limited printed sources on community impact were supplemented by visits to the Community University Research Associates and the Merrimack Education Center in Boston, to urban information and evaluation specialists in the City of Los Angeles, the University of Southern California and the Rand Corporation, to the highly effective

Service Bureau of the City of Dearborn, Michigan and to the Lyndon Baines Johnson School of Public Affairs at the University of Texas. (See Appendix D, "Site Visits Made By Project Team Members.")

(5) The Lakeway Inn Conference. On March 5, 1973, the CATE staff met at the Lakeway Inn to formulate the project's Technical Report and Handbook and to assign the writing of the various sections of the project's final products.

(6) Pilot Testing.

(7) Meetings with the Office of Education, Information, and Training in the Texas Department of Community Affairs. To assure that system development was attuned to the sponsor's evaluation needs, the staffs of CATE and the Office of Education, Information, and Training met approximately once a month to review the progress of DOES and to exchange information and suggestions. Meeting topics included: project planning, TDCA's Title VIII training, future funding, recommendation's for OEIT training subcontracting, pilot testing and evaluation workshops for the summer, 1973.

Search and Analysis

The search and analysis division of the CATE project was created in order to provide information from a wide range of sources in an organized form. Its objectives were not only to prevent a "re-invention" of the wheel, but to learn from the ideas of others and offer information which would aid in the process of building something new. The search and analysis activities have focused on collecting and analyzing information related to training and to the evaluation of training at the managerial-supervisory level. During the fall of 1972, six interviewers were sent to state, military, and industrial settings in the Austin, Texas, area which were chosen on the basis of their development of training programs (see Appendix A). At this point the interviewers collected training packages, manuals and materials which could be used directly in a training program. It was decided that an examination of training and evaluation programs and materials in the immediately surrounding community would provide a realistic sampling of what we might expect to find in other information centers across the country.

The training materials collected by the six interviewers were initially screened on the basis of the following five criteria: (1) Are course expectations stated in behavioral terms? (2) Are there clearly specified roles for learners and instructors? (3) Has any evaluation of the program been undertaken? (4) Are instructional materials provided for learners? and (5) Has the training program been developed by a professional organization or by qualified personnel?

After this initial selection of training materials a detailed analysis was made on the basis of the criteria listed below. These criteria were grouped into three divisions. The first division focused on Program Goals, Learning Experiences and Evaluation: (1) Is there an explicitly stated general goal for the training package? (2) Are there specific objectives for each unit of the training package? (3) Is there a clear correspondence between the general goals and the unit objectives? (4) Are the unit objectives stated in learner behavioral outcomes? (5) Do the unit learning experiences appear to be consistent with the unit objectives? (6) Are the learners informed of the unit objectives which they are expected to acquire? (7) Are learners provided with an opportunity to practice the unit objectives they are expected to acquire? (8) Are provisions made for feedback to learners regarding their progress during the training? (9) Are provisions made for feedback to learners regarding their achievement at the end of training? (10) Are self-evaluation devices built in for learners to evaluate their progress en route? (11) Are performance evaluation measures available to determine learner achievement? and (12) Are performance evaluation measures congruent with unit objectives?

The second division focused on the Characteristics of Instructional Materials and Activities: (1) Are the roles for instructors clearly defined? (2) Are the roles for learners clearly specified? (3) Is training provided for instructors? (4) Are the training materials diversified? (5) Are the training activities diversified? (6) Are materials likely to be perceived as corresponding to the developmental level of the learners? (7) Are pre-tests provided for learners? (8) Can the trainees start at an advanced level? (9) Can they finish at different levels? (10) Is the format of the material conducive to easy use? (11) Is the presentation of material logically related to objectives? (12) Is the format of the material interesting to the reader? (13) Is the information included in the material accurate? (14) Is the information of importance to the training objectives (as opposed to being trivial)? and (15) Does the language usage lend clarity of expression?

The third division focused on the Characteristics of Evaluation Materials: (1) Are evaluation devices available? (2) Are evaluation items related to learner performance objectives? (3) Are field test data available on evaluation instruments? (4) Are learners given the opportunity to practice on items similar to criterion items? (5) Are problem solving techniques used to measure learner behavior? (6) Have results of previous evaluation been built into the training package? and (7) Are self-evaluation devices built in for learners to evaluate their own progress?

After analyzing the training materials collected by our interviewers of the state, military and industrial settings in the Austin area on the basis of the above criteria, it was concluded that the search and analysis activities should be focused on library resources and materials that could be obtained through correspondence. Such resources would not only widen the range of materials, but enable a more specific examination of the processes involved in constructing a training and evaluation package oriented towards giving information to decision-makers.

It was then decided that information searches should focus on the actual processes of training, job performance, and community impact, and continue the occupational focus on supervisors and housing managers.

The library reference sources and the major and minor descriptors used are listed in Appendix B. A bibliography is attached to this report as well as an addendum to the bibliography for materials received up to the closing date for this stage of the CATE project. A variety of information sources were contacted by mail and a detailed listing of these sources appears in Appendix C. In addition to the information sources listed above, information was also retrieved through site visits made by project team members (see Appendix D).

The search and analysis team systematically retrieved information on topics related to the major and minor descriptors listed in Appendix B. This material was analyzed not only from the standpoint of the criteria listed above with respect to training packages but also from the standpoint of its potential for aiding the CATE project team in constructing a decision oriented training evaluation package. This information was in turn categorized by major descriptors and subsequently presented to project team members for their examination in abstract form. Whenever abstracts were of particular interest to project team members, a hard copy or microfilm copy was obtained either through correspondence or through information resources available in Austin, Texas.

In order to make the materials readily accessible to project team members, all training packages, abstracts, hard copy and microfilm were categorized in the following general manner: 1) materials obtained through the University of Texas library system; 2) materials obtained through correspondence; 3) materials obtained through interviews and 4) materials obtained through TDCA or HUD. Within this general classification schema the materials were filed in the following categories: 1) training; 2) job performance; 3) community impact; 4) evaluation; and 5) decision making. Materials that were judged to be especially relevant to our project goals were filed for immediate accessibility. Materials only indirectly related to project goals were labelled as "rejects" and filed separately.

Another filing system was set up in order to keep a record of the location of all materials at any given time. A file box was organized containing 3" x 5" notecards with references written in American Psychological Association style. The names of project team members requesting particular references were written on the back of the cards, along with the date at which the request was made. Separate reference cards were also kept for the various team members to record their comments. This recording system made it possible for team members to remind themselves of references containing specific information which interested them.

The final part of the search and analysis record keeping was a notebook containing the following information: 1) suggested procedures for search and analysis; 2) documentation of interviews; 3) correspondence; 4) University of Texas library reference resources pertaining to the development of a training and evaluation package; and 5) search and analysis memoranda and information circulated among the CATE project team.

PART II

Training Evaluation

Job Performance Evaluation

Community Impact Observation

TRAINING EVALUATION

Introduction

The purpose of this section is to show the relationship between training and evaluation as they fit into The Decision Oriented Evaluation System; and to illustrate this relationship by an application of evaluation to a training activity. The section begins with an overview of training and evaluation. This overview is followed by a more precise statement of training as implemented by the Texas Department of Community Affairs. Finally, the general approach to training evaluation formulated by the CATE project is presented.

Training--The State of the Art (General)

Background

Training can be broadly defined as the passing of knowledge and skills to people who don't have them. Earliest forms of training probably involved primitive men who had mastered their circumstances showing others around them how to use simple tools and weapons. Steinmetz (1967) traces the evolution of training from about 3500 B.C. to 1966. He points out that up to the Industrial Revolution in 1790, training was primarily that of skill development of craftsmen. The apprenticeship system and the formation of guilds were critical developments in organizing the training of craftsmen.

Major impetus in training development was provided by the need to obtain skilled workers to support World War I manufacturing effort. To meet the need for 600,000 shipyard workers, Charles Allen, the head of The Emergency Fleet Corporation of the United States Shipping Board, implemented his four-step method of job instruction training--(1) Show, (2) Tell, (3) Do, and (4) Check. Drawing on the experience gained in training workers in World War I, industry in the United States refined and applied the same strategy to meet the World War II crisis. This effort resulted in the permanent establishment of training departments in industry.

Coupled with the increasing importance of training in industry was the recognition by the Federal Government that training was vital to the well-being and survival of the United States. This importance is exemplified by the Smith-Hughes Act of 1917 which provides $7 million annually for vocational education and more recently (1962) by the Manpower Development and Training Act focused on training the unemployed (Steinmetz, 1967).

The critical role of training in the military has been underscored by Clark and Sloan (1964) who estimated that there are more people in training in the armed forces than the combined enrollment of all universities and colleges in the United States. In fact, the United States Air Force alone devotes over $1 billion to training each year (Air Training Command Fact Sheet, 1972).

At present (1973), the state of the art of training can be analyzed by examining training research and training development.

Research

Although the research reported in Psychological Principles in System Development (Gagne, 1962) and The Engineering of Educational and Training Systems (Smith, 1971) addresses some of the methodological and systems problems involved in training, operationalization of their techniques remains limited and has not yet been comprehensively applied and evaluated.

The importance of training in the United States appears to be pervasive, and yet research focused on training seems meager by comparison. For example, Wenig and Wolansky (1972) report in their review of the literature on job training in industry that:

> (1) Studies to fill the information gap on the scope and nature of job training in industry need to be made.
>
> (5) Since most workers are informally trained on the job and since very little, if any, information is available about this type of job training in industry, it appears that research is needed about the relationship between informal and formal training upon selected types of workers in various settings and occupational groupings to determine which type, either informal or formal training, is more effective for a particular type of worker or in particular industrial or business settings.
>
> (7) Research is needed for developing more imaginative planning and programming in the area of upgrading. Patterns are necessary for breaking down skill levels to a simpler category. (pp. 47-48)

Development

A major advance in the development of training has been made by the military and is exemplified by Smith (1971). He advanced an instructional system which is based on the systematic identification and specification of tasks necessary in the performance of a given job. Specific performance objectives are derived from task analyses and subsequent training activities are developed to maximize the probability that a student will achieve the stated objectives. An evaluation component which constantly provides trainers with information regarding the degree to which objectives are being successfully achieved is central to the training system. A low success rate generally indicates that something is wrong with the instruction and not the students.

In spite of the fact that the literature remains replete with unanswered questions about training, significant trends in improving training have been found (Wenig and Wolansky, 1972). They cite the following trends reported by Lippitt (1969):

1) Effectiveness of training based on worker performance and not merely increased trainee knowledge.
2) Industry developing in-house job training capabilities rather than depending on outside experts or resources.
3) More homogeneity in training groups so that trainees learn to function together as members of a cooperative organization.
4) Instead of vague assurances that training will be desirable for trainees, greater emphasis on goal orientation.
5) Learning that is trainee self-activated rather than imposed on him.
6) The application of reinforcement strategies and follow-

up experiences for trainees which provide more lasting learning.

7) Reduction in the use of structured nonparticipative approaches to learning and more activities that are action oriented.

8) Planning and developing training activities that focus on learning how to learn.

9) Demands of evaluation of training instead of accepting the results on faith.

Evaluation

Evaluation of training has taken a number of different forms. The methods used to evaluate training have ranged from asking a person how he liked the training to precise observations of a trainee's execution of the complex skills necessary to perform a job task. The first method has been criticized because it provides little or no information regarding the "effectiveness" of the training; and the second method of evaluation mentioned, although apparently quite valid, is very expensive. The mid-ground used to obviate these criticisms has been the use of some type of objective test to collect information which is thought to approximate actual performance requirements.

The shift from norm-referenced tests (like those used in most colleges and secondary schools) to criterion-referenced tests has been evident in job training. It has become blatantly apparent that if the objective of training is to equip a worker with the skills necessary to operate a drill press, comparing his score on some test with scores made by other trainees would provide precious little information about how well the worker can operate a drill press. Use of performance criteria, although not a new concept, is beginning to enjoy widespread support from the developers of training programs. (This is especially true in the military.) Consequently, the evaluation of a training program or course in which performance objectives have been specified has become somewhat less complex. There are, however, notable problems remaining for those involved in evaluating training.

One problem deals with the validity of "test" situations compared to using actual job situations in determining the effectiveness of training. The further removed a trainee is from the real task, the more difficult it becomes to trace the transfer of training.

A second problem focuses on how well the trainee performs his job tasks after the completion of training. There are many possible intervening factors which may obfuscate the actual effectiveness of training, such as the trainee's attitude or interpersonal problems with peers or supervisors. Other facts which may add to the complexity of adequate evaluation are related to the levels of training performed. The more skill oriented the training is, the more likely adequate and informative evaluation is. Thus, the design of effective training must take such factors into consideration and evaluation must account for these factors.

Training and Evaluation (General)

Training Package

A critical assumption underlying the development of training packages is that training is necessary to change job performance. Thus, some immediate questions are raised: (1) What kind of training is necessary; (2)

At what level should training be focused; (3) What level of training should be applied; (4) What are the general goals of the training; (5) What are the specific objectives of training; (6) What precise behavior or performance do we want changed; and (7) Exactly how do we want behavior or performance to look at the end of training. If answers to these questions are provided, the design and subsequent evaluation of training packages is straightforward.

Goals of training. There are a number of specific procedures which may be used to determine the goals of training. These procedures fall under the general term of "needs assessment". Any training goal, therefore, should be derivable from and directly related to problems identified by needs assessment. In this case, a problem may be defined as the discrepancy between the way things should be (what is desired) and the way things actually are. If specific discrepancies cannot be identified, the design of training may be premature and an inefficient use of resources will result. If discrepancies can be specified, the goals of training should be directly related to the discrepancies and internally consistent with them. Thus, goals of training should be derivable from specific problems.

Objectives of training. The objectives of training should be derived directly from the goals of training in the same manner that goals of training should be directly related to specific problems. Whereas the goals of training are stated in general terms, the objectives of training should be stated in much more precise language. Preciseness may be obtained by stating desired training outcomes in terms of behavioral objectives. A behavioral objective usually specifies the precise *behavior to be performed* (and observed), the *conditions* under which the performance will take place, and the criteria to be used in judging the adequacy of the performance.

Levels of Training

The identification of training goals and objectives will generally prescribe the levels of training necessary to enable trainees to obtain the desired training outcomes. There are three major levels or outcomes of training. At the lowest level, outcomes may be specified in terms of "making trainees aware of", or "making trainees familiar with" some aspect of their job. The next level of training is focused on having trainees acquire and have knowledge about job related information. The highest level of training is aimed at providing specific skills in trainees to enable them to perform their job tasks more effectively. Once the levels of training have been determined for obtaining specific objectives, specification may be made of the levels of evaluation appropriate for judging training success.

Levels of Evaluation

The evaluation of training must begin with a consistency analysis between training goals and training objectives. A consistency analysis systematically evaluates the degree to which needs, goals, objectives, and training derive from one another and are congruent with each other. If there is little consistency among the needs, goals, objectives and training, further evaluation is inappropriate.

Once consistency between goals and objectives has been verified, specification of evaluation levels may begin. There are three major levels of evaluation. The purpose of evaluation at the first level is to determine if trainees have acquired and comprehended information given them. At the second level of evaluation, trainees are asked to interpret and apply the information they have received. The third level of evaluation calls for the trainees to demonstrate how adequately they have mastered the skills they have been taught. The degree to which training objectives are achieved is indicative of the success or adequacy of training. Evaluating training success is, therefore, directly related to the specific objectives of training.

Equivalence of Levels of Training and Evaluation

Although it is possible to use different levels of evaluation for any level of training, the effectiveness of training may most adequately be determined by designing evaluation for the level at which training is provided. Once again, however, the training objectives and the training activities should be internally consistent. If the purpose of training is to familiarize trainees with a certain set of procedures which are to be used on their jobs, it would be inappropriate to measure the degree to which trainees could reproduce the content of those procedures. On the other hand, if the purpose of the course is for trainees to use a set of procedures in performing a certain task observing their performance in following and using these procedures would be appropriate evaluation.

Since the general goal of training is to "close the gap" between how things should be and the way things actually are, it is most desirable to use evaluation to provide evidence that this gap is indeed being closed. If this goal is to be achieved, care should be given in applying levels of evaluation which are consonant with training levels.

CATE General Approach to Training Evaluation

The major underlying assumption that is made with respect to training evaluation is that the training activity will result in behavioral changes. It is further assumed that these behavioral changes can be traced to more adequate job performance and that more adequate job performance will enable an organization to more adequately achieve its goals. These assumptions are viable only when the following conditions are met:

1) The goals of the organization are achievable and are stated in measurable terms;
2) The training goals are derivable from organizational goals and are also directly related to job performance;
3) The training objectives are derivable from training goals and are stated in job performance outcome behavior based or job task analyses; and
4) Training is focused on increasing the competencies of trainees to perform skills which are necessary for adequate job performance.

If the above assumptions are valid and if the necessary conditions are met, adequate evaluation is possible. Thus, the degree to which evaluation is effective is directly related to how many assumptions and conditions of training are met. The fewer the number of assumptions and conditions met, the more limited the adequacy of the evaluation.

Goals of Training

Among the first steps in evaluating training is to determine the adequacy of training goals. Some of the major questions which are asked in this phase of training evaluation include:

1) Are the organizational goals stated in measurable terms - can accomplishment of these goals be determined?
2) Is there a discrepancy between the goals of an organization and what is actually being done?
3) Can the discrepancy be resolved by training, or is there a more efficient and effective way of closing the gap between the way things are and the desired goals? and
4) Are training goals directly related to organizational goals?

Adequate answers to these questions are prerequisite to any further evaluation being effective. If the analysis of answers to these questions determines that the problem is one of training and that the goals of training are specified in observable terms, the evaluation of training objectives may be performed.

Objectives of Training

The cornerstone of evaluating the appropriateness of training objectives is the degree to which these objectives are derived from training goals and the degree to which these objectives are based on task analysis data and job performance requirements. Central to evaluating this phase of training are the following questions:

1) Are the objectives of training directly related to the goals of training?

2) Are the objectives of training based on task analysis data and job performance requirements (is there a discrepancy between job performance requirements and task analysis data)?

3) Are training objectives stated in behaviorally observable terms? and

4) Given time and money constraints, can training activities be designed which have a reasonable probability of enabling trainees to achieve these objectives?

Satisfactory answers to the foregoing questions will generally provide the guidelines and standards necessary for the development of training activities and subsequent training activity evaluation.

Training Materials and Activity

Background information. To make effective decisions about training and training materials, the decision-maker should know something about the basic elements of training systems development. This basic information will help him in judging the quality of training materials and in developing guidelines for the subcontracting of training materials.

A training system is conceived of as an integrated set of resources, human and material, designed to achieve specified outcomes in learners. The outcomes of any training program should be a set of skilled behaviors related to the job performance requirements within an occupation. The development of a training program must start with a thorough analysis of the tasks required to perform a job, and proceed through a sequence of specific steps that terminate with verification of the training system as producing the results intended in trainees. The following model used by Air Training Command (1970) is illustrative of the process.

Insert Figure 1 about here

A brief description of the Air Force model components follows:

1. Analyze System Requirements: This step requires the developer to identify job tasks within the larger context of the system within which the job is to be performed. The analysis must describe the setting within which jobs are to be performed and all the interpersonal and/or man-machine relationships related to the environment of the operational system.

2. Define Education or Training Requirements: This step follows an analysis of job performance requirements and identifies the duties and tasks requiring instruction. The level of difficulty of tasks, resources available, and development time required are identified during this phase.

3. Develop Objectives and Tests: Criterion behaviors desired as end products of training are identified and enabling objectives (prerequisite knowledge, skills and attitudes) are specified. Performance tests are developed to reflect the job behaviors that are the object of training.

4. Plan, Develop, and Validate Instruction: The sequencing of instruction, the selection of instructional materials and methods, the development and testing of program prototypes comprise this design phase of the cycle.

5. Conduct and Evaluate Instruction: The field testing of an instructional system with particular emphasis on data based revision or redesign of the instructional sequence and materials is a critical step. The

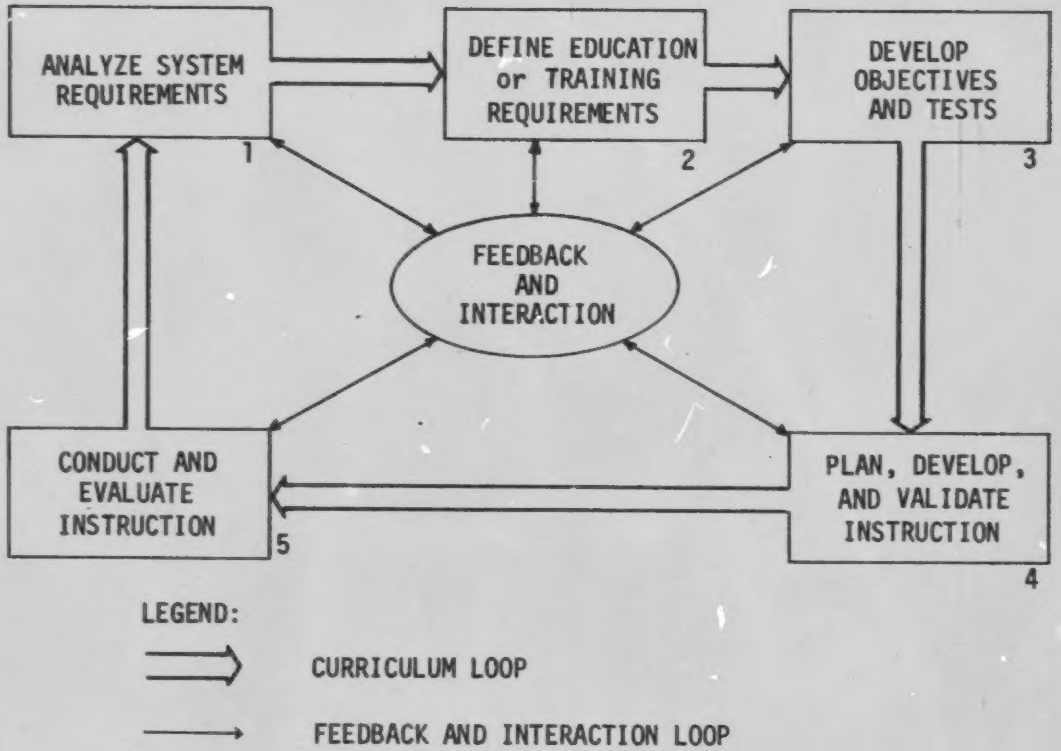

ANALYZE SYSTEM REQUIREMENTS
1
DEFINE EDUCATION or TRAINING REQUIREMENTS
2
DEVELOP OBJECTIVES AND TESTS
3
FEEDBACK AND INTERACTION
PLAN, DEVELOP, AND VALIDATE INSTRUCTION
4
CONDUCT AND EVALUATE INSTRUCTION
5
LEGEND:
CURRICULUM LOOP
FEEDBACK AND INTERACTION LOOP

Figure 1

INSTRUCTIONAL SYSTEM DEVELOPMENT MODEL

(Department of the Air Force, 1970, p. 1-5) developer must rework the system until it produces the intended results with learners.

The most critical element, then, in a training program is the clear specification of job requirements, training objectives related to requirements, instruction designed to produce the behavioral outcomes, and evidence that the behaviors have been produced.

Smith's (1966) model of an instructional system brings one closer to the process of conducting a training program and includes some important principles of training. A presentation of the model is displayed in Figure 3 and a brief discussion of its elements follow:

Insert Figure 2 about here

From an analysis of the job performance requirements of trainees according to Smith's design, the developer selects specific behavioral objectives for the training program. Practice of performance refers to that aspect of training which engages the learner in the practice of the tasks and the skill components of training in a job simulation setting. Practice of knowledge provides for the learner to use the symbolic processes (e.g., key words, terms, concepts, diagrams) related to job performance and to receive feedback or knowledge of results throughout training. Presentation of knowledge refers to the means by which knowledge is transmitted to learners. Lectures, reading, graphic aids, and films are among the most commonly used presentation modes. Management of students refers to the techniques used to

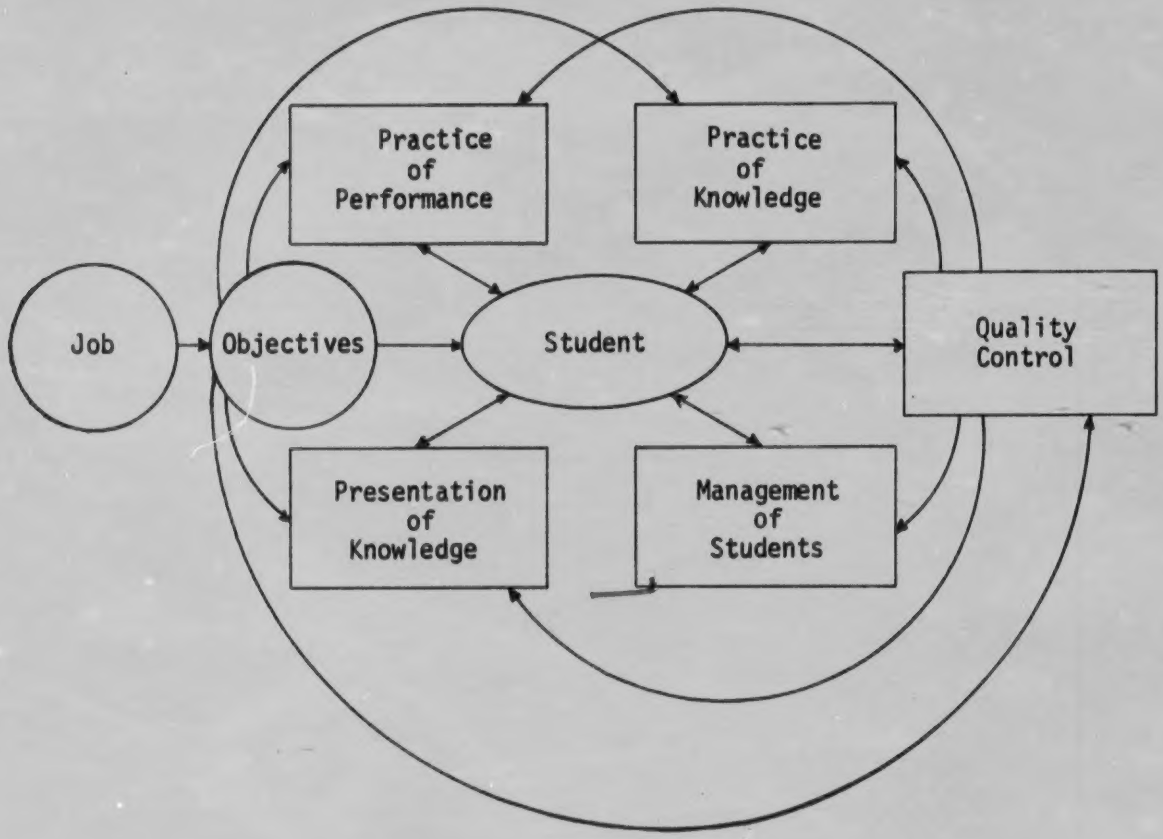

Practice
of
Performance
Practice
of
Knowledge
Job
Objectives
Student
Quality
Control
Presentation
of
Knowledge
Management
of
Students

Figure 2
A Model of an Instructional System

(Smith, 1966, p. 7)

keep students participating productively in the learning experiences. Quality control refers to the processes employed to gather data on the effectiveness of the training system in accomplishing its objectives. An equally important aspect of quality control is to provide guidance regarding how the instructional system might be changed to increase its effectiveness.

One other important ingredient of a training system is the specification of standards of proficiency that trainees should attain at the end of course instruction. These standards may also reflect a developmental process by which a trainee progresses through levels of job performance (i.e., apprentice, journeyman, master). Proficiency levels at end of training depend upon the entry characteristics of the trainees and may be perceived as part of a longitudinal effort that will be combined with on-the-job training to ultimately reach desired levels of job performance.

Background information summary. The purpose of this section has been to provide the decision-maker with an orientation that will help him see the relationship of an isolated or short term training program, to the overall process of the design of an instructional system that is based on an analysis of job performance. These concepts are presumed to be helpful in assisting the decision-maker to judge the quality of training programs and prepare specifications for the development of training materials.

Training Materials Evaluation

Background information. The guidelines that follow will provide the decision-maker with key ideas related to the development of training materials, or to the evaluation of training packages. These guidelines have been derived from an extensive analysis of the literature on training materials development, and from the reported research. It needs to be mentioned that there are few empirical based generalizations that can be stated about the effectiveness of specific classes of media related to training instructional effectiveness: this is largely due to methodological problems in instructional research. For example Baker (1973) reports that there is little evidence to support the notion that given a media as media provides for more effective learning. Briggs (1967) does point out, however, that multi-media instruction has proved to be superior to single-media instruction.

In the absence of generalizable, empirical based guidelines to support training materials development, one must turn to the examination of specific training materials that have undergone evaluation and do produce the desired results in learners. Examination of these materials provides a basis for development and also provide guidelines criteria that could be applied to the analysis of training materials.

In summarizing the available literature on training and in drawing extensively on the training research experience of HumRRO, Smith (1966) states some guidelines related to this instructional system design:

The critical aspects of practice of performance are:

a. to simulate the job task, using a detailed description as a guide

b. to provide for knowledge of results

c. to arrange a suitable practice schedule

d. to maximize the transfer of training.

The critical aspects of *practice of knowledge* are:

a. to determine, through analysis, the relation between cues and responses required by the knowledge

b. to develop, through practice with knowledge of results, a high level of achievement

c. to devise ways of making material meaningful to trainees.

Presentation of knowledge can be done successfully by any of several methods provided:

a. the presentation communicates to the student

b. the material presented is meaningful

c. the special characteristics of media are taken into account.

Instructional devices and media should be selected in terms of cost and effectiveness.

The Air Force Manual on Instructional System Development (AFM 50-2) provides an excellent overview of the principles and practices that one ought to take into account when planning, developing and validating instruction. In presenting options to be pursued in the selection of media, the manual presents a very useful adaptation of a media selection matrix developed by Allen (AFM 50-2, pp. 5-14).

Insert Table 1 about here

The ratings of high, medium and low in Table 2 refer to the degree of suitability of the instructional media when compared to the objectives of learning.

TABLE 1

Instructional Media Stimulus Relationships to Learning Objectives

▼ TYPE OF INSTRUCTIONAL MEDIA	LEARNING OBJECTIVES:					
	Learning Factual Information	Learning Visual Identifications	Learning Principles, Concepts, and Rules	Learning Procedures	Performing Skilled Perceptual-Motor Acts	Developing Desirable Attitudes, Opinions, & Motivations
Still Pictures	Medium	HIGH	Medium	Medium	low	low
Motion Pictures	Medium	HIGH	HIGH	HIGH	Medium	Medium
Television	Medium	Medium	HIGH	Medium	low	Medium
Training Aids	low	HIGH	Medium	Medium	low	low
Audio Recordings	Medium	low	low	Medium	low	Medium
Trainer (Simulator)	Medium	HIGH	HIGH	HIGH	HIGH	Medium
Programmed Instruction	Medium	Medium	Medium	HIGH	low	Medium
Demonstration	low	Medium	low	Medium	Medium	Medium
Printed Textbooks	Medium	low	Medium	Medium	low	Medium
Oral Presentation	Medium	low	Medium	Medium	low	Medium

Note.--This table is adapted from Dr. Allen's paper, "Research in Instructional Media and Art Education," which was originally published in August 1966 in *Final Report of the Uses of Newer Media in Art Education Project* by the National Art Education Association, NEA, Washington, D. C.

Given this brief overview of characteristics of training systems, the criteria displayed in Table 2 and Table 3 will prove to be helpful in analyzing the potential effectiveness of training materials and/or training programs. Table 3 is adapted from Smith (1966, pp. 83-85).

Insert Table 2 and Table 3 about here

The checklists displayed in Table 2 and Table 3 provide the decision-maker with important characteristics of training programs/materials that should be taken into account. It might be helpful to present these characteristics in the form of Good, Better, Best for classification purposes.

Characteristics of Training Programs

Good. A good training program will have: (8-24 hours of instruction)

1. A statement of outcomes in learner behavioral terms that:
   - lend themselves to observation or measurement
   - have a direct bearing to job performance
   - are consistent with the goals of training and with the training strategies.
2. A variety of instructional materials and/or techniques which actively involve the trainee.

Better. A better training program (24 to 40 hours of instruction) in addition to 1 and 2 above will have:

3. Provisions for trainees to practice (simulate or role play) the behaviors for which they are being trained.
4. Explicit provisions for self-evaluation and feedback

TABLE 2

CRITERIA FOR THE ANALYSIS OF TRAINING MATERIALS

Program Goals, Learning Experiences and Evaluation	Yes	No
1. Is there an explicitly stated general goal for the training package in terms of learner behavioral outcomes?		
2. Are there specific learner behavioral objectives for each subunit of the training package?		
3. Is there a clear correspondence between the general goals of and the unit objectives?		
4. Do the learning experiences appear to be consistent with the unit objectives?		
5. Are there provisions to inform learners of the objectives which they are expected to acquire?		
6. Are learners provided with an opportunity to practice the unit objectives they are expected to acquire?		
7. Are provisions made for feedback to learners regarding their progress during the training?		
8. Are provisions made for feedback to learners regarding their achievement at the end of training?		
9. Are self-evaluation devices built in for learners to evaluate their progress en route?		
10. Are performance evaluation measures available to determine learner achievement?		
11. Are performance evaluation measures congruent with unit objectives?		
Characteristics of Instructional Materials and Activities		
1. Are the roles for instructors clearly specified?		
2. Are the roles for learners clearly specified?		
3. Is training provided for instructors?		
4. Are the training materials diversified with respect to media and instructional methods?		
5. Are the training activities diversified for learners?		

Yes No

6. Are materials likely to be perceived as corresponding to the developmental or maturity level of the learners? ____ ____

7. Are pretests provided for learners? ____ ____

8. Can the trainees start at an advanced level? ____ ____

9. Can they finish at different levels? ____ ____

Characteristics of Evaluation Materials

1. Are evaluation items and/or devices available? ____ ____

2. Are evaluation items related to learner performance objectives? ____ ____

3. Are learners given the opportunity to practice during training on items similar to criterion items? ____ ____

4. Are problem solving techniques used to measure learner behavior? ____ ____

TABLE 3

A CHECK LIST FOR EVALUATING TRAINING
(Correct Answers Are Capitalized)

1.	Obtaining information concerning the job for which the student is being trained.		
a.	Is there a procedure for obtaining information about the job?	YES	no
b.	Is the procedure applied systematically and consistently?	YES	no
c.	Does the procedure collect performance information for meaningful units of activity?	YES	no
d.	Is performance information actively sought from sources in the work or life performance situation?	YES	no
e.	Is performance information recorded?	yes	NO
f.	Is performance information used systematically and consistently to identify critical instructional needs?	YES	no
g.	Does the procedure provide complete coverage of all likely aspects or occurrences of the desired work or life performance situation?	YES	no
h.	Does the procedure identify performance actions, condition, and standards relevant to the work or life situation?	YES	no
2.	Identifying specific training objectives.		
a.	Are decisions about what to teach made on the basis of reliable and valid data?	YES	no
b.	Are detailed analyses made of tasks to be taught as a basis for identifying knowledges and skills required for task performance?	YES	no
c.	Are all skills and knowledges required for task performance identified?	YES	no
d.	Do training objectives state precisely the performance actions, conditions and standards?	YES	no
e.	Do specific training objectives use vague terms, such as know, understand, appreciate, familiarize, general knowledge, working knowledge, qualified?	YES	no
3.	Establishing the sequence of instruction.		
a.	Is there an effective orientation of the student to the entire job to be learned?	YES	no
b.	Are there blocks of skills and knowledge taught in isolation from their use in job tasks?	yes	NO
c.	Are new skills and knowledges taught only when required in order to master a new task?	YES	no
d.	Is the learning of new knowledge followed immediately by practical exercises?	YES	no
e.	Is the relation of each new task to be learned to the overall job clearly stated to the student?	YES	no

4. Designing situations for the practice of performance.		
a. Are practice situations based on an analysis of the task to be learned?	YES	no
b. Does the student practice the entire task?	YES	no
c. Has any part of the task been omitted from practice?	yes	NO
d. Do training devices simulate the task?	YES	no
e. Do instructions for effective use accompany the training device?	YES	no
f. Has the training device been evaluated in terms of developing student proficiency?	YES	no
g. Have training devices vs real equipment been subjected to cost-effectiveness analysis?	YES	no
h. Has the possibility of using obsolete equipment to teach appropriate skills been considered?	YES	no
i. Do trainees receive frequent and immediate knowledge of the effectiveness of their practice?	YES	no
j. Do trainees receive at least one minute rest between practice trials?	YES	no
5. Designing situations for the practice of knowledge.		
a. Is the knowledge to be practiced clearly related to an actual job task?	YES	no
b. Has information representing the job cues provided the student, and the responses he is to make, been identified?	YES	no
c. Has a practice session been planned for?	YES	no
d. Have appropriate practice materials (workbooks, self-instructional programs, flash cards, etc.) been designed?	YES	no
e. Do trainees receive frequent and immediate knowledge of the effectiveness of their practice?	YES	no
f. Do trainees maintain a record of their progress during practice?	YES	no
6. Preparing presentations to the student.		
a. Has the content of the presentation been tested on students to determine, by means of achievement tests, whether it communicates to the students?	YES	no
b. Is the content of the presentation meaningful to the student?	YES	no
c. Are there lengthy periods of presentation uninterrupted by practice?	yes	NO
d. Are films and television integrated with live instruction?	YES	no
e. Are lectures, demonstrations, films, television or tape recordings selected on a cost-effectiveness basis?	YES	no
f. Have texts been examined to be sure that they are within the reading capability of the student?	YES	no
7. Maintaining student learning activity.		

a. Has the degree of spread in aptitude scores of the trainees been determined? YES no

b. Have adjustments been made to the training schedule to account for differences in student aptitude? YES no

c. Have the interests, educational background, and attitudes toward formal schooling been determined? YES no

d. Is this infomation used to make training presentations more meaningful? YES no

e. Do students receive rewards that are significant to them when they achieve course objectives? YES no

f. Do student rewards include those that are under the control of the student company commander? YES no

g. Has coordination been achieved with the student company commander to make rewards under his control responsive to student performance in the training. YES no

h. Are successful students punished? yes NO

i. Are failing or borderline students rewarded? yes NO

j. Has an analysis been made of the amount and reasons for excused absences from class? YES no

k. Have steps been taken to reduce the amount of excused absences to a minimum? YES no

8. Control of the quality of the training.

a. Are the tests direct translations of the training objectives? YES no

b. Is emphasis given to performance tests? YES no

c. Are grades expressed in percentage passing? YES no

d. Are grades based on the bell-shaped normal curve? yes NO

e. Are grades based on percentile ranks? yes NO

f. Are test items changed to make them easier or harder to conform to an "ideal" distribution of grades? yes NO

g. Are results of student testing provided to the instructional departments? YES no

h. Do the departments make changes in training procedures suggested by the results of student testing? YES no

(Reference: Smith, Design of Instructional Systems.)

to trainees on behaviors they are expected to acquire.

5. Built-in evaluation of training techniques which require trainees to exhibit skills, demonstrate knowledge, provide an affective response to training; where possible, evaluation instruments should use naturalistic and/or unobtrusive observation.

Best. The best possible training program will have, in addition to the above:

6. An explicitly stated rationale for the training program that provides statements of:
   - documented need for the training
   - assumptions, theory or evidence that supports the instructional approaches used
   - evidence that "real world" job analyses have been conducted to derive training objectives.
7. A history of the development effort which includes pilot and field test data and course revision made on the basis of trainee performance behavioral data.

Guidelines for Determining the Quality and Effectiveness of Training Programs

There are a great many practical outcomes from psychological research and training experience that provide valuable information for training officers in local, state or federal government. These outcomes have been adapted from Tyler (1955) and are presented below in the form of principles and characteristics to the training officer as background information. The principles and characteristics may be useful in judging the quality of a) training materials, b) training-in-action, or c) in developing RFP's for training materials.

Psychological Principles Useful in Training Materials Development

1. Learning depends upon motivation.
2. Learning depends upon the capacity of the trainee.
3. Learning depends upon the previous experience of the trainee.
4. Learning depends upon perceiving relevant relationships.
5. Learning depends upon an active search for meaning on the part of the trainee.
6. Learning depends upon feedback provided to the trainee.
7. Learning depends upon achieving satisfactory personal and social adjustment in the training environment.
8. Learning founded upon the search for meaning will be more likely to be repeated and applied in new settings.

Characteristics of Effective Training Experiences

1. Provide the trainee with the opportunity to practice the type of behavior he is expected to exhibit on the job.
2. Provide the trainee with the opportunity to deal with the knowledge content implied in training objectives.
3. Are within the experience range and within the mental ability range of the trainee.
4. Build on the past experience of the trainee.

5. Are satisfying to the trainee.
6. Are perceived as relevant by the trainee in relation to his current job and his career aspirations.
7. Demonstrate to the trainee all of the enabling objectives and tasks required to reach the training goal.
8. Provide feedback to trainees *en route* regarding achievement of objectives so that it can be used in guiding training activity.
9. Require good personal and social relations.

Table 4 provides a systematic procedure for judging the quality of a training program. Although it is possible for decision-makers to use the above procedures *in vacuo*, it is more effective to include developers and evaluators in this feedback process.

Insert Table 4 about here

Contact with Developers

It may be apparent by now that the evaluation of training involves more than just determining the adequacy of the training activity. Evaluation must be applied at all points of the training system. Thus, if part of the training system is subcontracted (e.g., the development of instructional materials and activities), it is necessary that those performing evaluation maintain liaison with the subcontractors. The role of the evaluator in this instance is to provide continuing feedback to the developer regarding the adequacy of instructional objectives, instructional materials, and instructional processes. In this way, the probability of achieving a maximally effective

TABLE 4

How to Judge the Quality of a Training Program

Things you must do before you examine existing program manuals and materials.

Step 1. Specify: training population--who is to be trained?

length of training in hours--how long?

general goals of training--what do you want from training?

type of training--what kind of experience do you want for trainees?

cost--how much can you pay? how much can trainee pay?

Step 2. Define what you mean by training:

Do you intend your training to:	yes	no
1. present information	____	____
2. develop awareness	____	____
3. communicate theory/knowledge	____	____
4. promote identification and application of principles	____	____
5. develop an orientation	____	____
6. change attitudes	____	____
7. produce skilled behavior	____	____

Things you do to judge the quality of training packages you are examining:

Step 3. Examine and judge the goals and objectives of the training package in terms of:

	acceptable to you	unacceptable to you
1. correspondence with your objectives	____	____
2. course length	____	____
3. relevance to your needs	____	____
4. scope of objectives	____	____
5. behavioral quality of objectives	____	____
6. relevance to your pocketbook	____	____

	yes	no
Step 4. Examine and judge the experiences provided for trainees		
Are they related to your objectives?	____	____
Do they require active participation of trainees	____	____
Are experiences varied	____	____
Step 5. Examine and judge built-in evaluation devices		
Are trainees made explicitly aware of outcomes?	____	____
Are trainees given opportunity to evaluate their own knowledge of skill acquisition?	____	____
Are trainees provided feedback on their experience?	____	____
Do trainees have opportunity to rate effectiveness of training?	____	____
Step 6. Examine and judge background information on training program		
Do developers have adequate qualifications?	____	____
Is instructor's role clearly specified?	____	____
Is previous evaluation data presented?	____	____

Step 7. Summarize your judgments and decide

- Use program as is.

Seek modifications in the program to make it more congruent with your needs.

Judge it as inadequate for your needs.

training package is increased. Parenthetically, it is probable that the amount of liaison between developers and evaluators will be dictated by the strength of the RFP guidelines. The more comprehensive the guidelines, the less the amount of liaison between developer and evaluator will be.

There are, however, critical contacts between the developer and evaluator which must be maintained. It is necessary, for example, that developers and evaluators agree, as soon as possible, on the instructional and behavioral objectives of the training materials and activities. This interface is critical, in that developers must have early feedback regarding the appropriateness of their efforts and that evaluators must have sufficient lead time to develop procedures for training evaluation. In addition, a possible spinoff of this liaison may be the inclusion of evaluation procedures as a part of the training activity itself - a very desirable state-of-affairs.

Criteria Development

Coupled with early specification of instructional and behavioral objectives is the determination of what criteria to use as indices of training success. Since assessing the adequacy of behavior for all objectives would be prohibitive in terms of time and since it would be inordinately expensive to develop and apply such evaluation procedures, it is necessary to determine what sample of behaviors (and the corresponding measurement standard) one is willing to accept as representative of the domain of behaviors that training is focused on changing. The specification of criteria at this point is a prelude to the development of criterion-referenced measures which will serve to help evaluate the effectiveness of training. Nitko (1972, p. 6) points out that there are four characteristics inherent in criterion referenced tests. These characteristics are:

(1) The classes of behaviors that define different achievement levels are specified as clearly as is possible before the test is constructed;

(2) each behavior class is defined by a set of test situations (that is, test items or test tasks) in which the behaviors can be displayed in terms of all their important nuances;

(3) given that the classes of behavior have been specified and that the test situations have been defined, a representative sampling plan is designed and used to select the test tasks that will appear on any form of the test;

(4) the obtained score must be capable of expressing objectively and meaningfully the individual's performance characteristics in these classes of behavior.

Glaser (1963) states, "The standard (or criterion) against which a student's performance is compared...is the behavior which defines each point along the achievement continuum (p. 519)."

"A criterion-referenced test, then, is one that is deliberately constructed to give scores that tell what kinds of behavior individuals with those scores can demonstrate (Glaser & Nitko, 1971)."

Selected articles have been collected by Popham (1971) which provide an overview to the state of the art of criterion-referenced measures. Glaser and Klaus (1962) relate the use of criterion-referenced measures to the problem of criteria development. They suggest that:

> The first step in the development of a proficiency measure is the specification of the behavior to be observed and measured. The ease with which this step can be carried out is dependent upon several factors including (1) the complexity of the behavior involved and the explicitness with which the behavior has been defined, (2) the purpose for which the measurement of behavior has been undertaken, and (3) the accessibility of the behavior to observation (p. 430).

The degree to which successful criteria development is possible rests with the adequacy of the task analysis (Miller, 1962). Without clear specification of job performance requirements, the development of criteria becomes a problem of intuition and guesswork. If this occurs, the best techniques available for training evaluation will be incapable of adequately assessing the effectiveness of training.

Techniques for Training Evaluation

For the most part, the techniques appropriate in most evaluation settings can be used in training evaluation. Test formats and item types are adequately summarized by Cronbach (1970), Anastasi (1968), Guion (1965), Glaser & Klans (1962) and Smith (1971). There are, however, some noticable differences in item selection and statistical manipulation of data between the classical test theory approach to measurement and the measurement of training outcomes. Basically, these differences revolve around the purposes for which the instruments are to be used. In classical test theory, for example, item selection is performed with the major purpose of maximizing the variation or the discrimination ability for each item (Nunnally, 1967). In contrast, evaluating training effectiveness suggests that criterion-referenced items should be minimally differentiating if the training has been effective, e.g., all trainees could conceivably answer all items correctly (Popham, 1971).

Data specification. Central to the issue of data specification is the adequacy of the training objectives. Training objectives which are behaviorally stated in measurable terms define what data are to be used in assessing training effectiveness. For example, the following training objective (Greg/McGraw-Hill and the Center for Vocational and Technical Education at the Ohio State University) not only specifies what behavior a trainee must be trained in, but it also specifies what class of data must be obtained to determine if the trainee has successfully demonstrated such behavior:

"Given a monthly departmental report of four pages in revised, typed draft, with all details complete and organized, the typist executes four duplicating stencils (to send to a duplicating department) on an electric standard typewriter acceptably within (number) minutes (p. 48)."

In this case, acceptably may further be defined by the number of typing errors allowable (e.g., one error per page). The data which may be used to evaluate performance may now be specified in terms of the number of errors, the number of minutes, or some ratio of errors to minutes. Data are therefore specified in relation to some expected standard of performance and performance may be evaluated in these terms.

Data collection. The collection of data is dependent on a number of issues, foremost of which is the degree to which data specification has dictated what data are to be collected. For example, the above stated objective demands that data be collected under the conditions of the objective. Therefore, the data collected will be four stencils typed in (number) minutes on an electric standard typewriter. In this case, a formal test may be given (obtrusive measures) or a typist's daily training records may be reviewed (unobtrusive measure). Data for these conditions can be obtained from training records which indicate at what performance level a typist is functioning. Thus, unobtrusive evaluation can be built into the training activity by merely keeping training performance process records.

Other issues underlying the data collection problem are summarized in Table 5 in which the data collection mode, the advantages and disadvantages of that mode, and a conclusion regarding the use of that mode of data collection are displayed. Parts of Table 5 are adapted from Frederiksen, in Glaser (1962).

Insert Table 5 about here

Data processing. Although most data processing can be performed adequately by hand, the disadvantages far outweigh the advantages. A more efficient, flexible, and accurate method of data processing can be found in the use of automatic equipment such as key punch machines, card sorters, and computers. The advantages of machine use for data processing begin with accuracy. For example, key punching and verifying data directly from process records or evaluation test forms can be expected to result in less than one data error for every 1000 datum recorded. Usually the error rate is

TABLE 5 *

EVALUATION MEASURES--ADVANTAGES & DISADVANTAGES

Approaches for Obtaining Evaluation Measures	Advantages	Disadvantages	Conclusion
1. Solicit Opinions Student--	1. Highly reliable judgements about teaching can be made. 2. Useful for learning student's opinions. 3. Easily done.	1. High reliability is in part a result of student pre-discussion, which destroys specificity. 2. Evaluates instruction, not job performance. 3. Students are inclined to say favorable things. 4. Students may not be good judges of performance.	As a way of evaluating success in achieving training objectives, the method has little to commend it except the ease with which it can be done.
Expert--	1. Useful to an instructor, to correct presentation faults.	1. Evaluates instruction, not job performance. 2. Lack of specificity.	Misses the pay-off question; to what extent has behavior been modified
2. Administer Attitude Scales	1. Obvious approach to find out if student has adopted desired attitudes is to ask the student. 2. Easily done.	1. Bias due to response set. 2. Evaluator is interested, not in attitudes, but in behavior changes presumably related to attitude. 3. Lack of specificity.	We rarely have evidence that a score on an attitude scale is correlated with behavior to any marked degree.

*Table 5 summarizes Frederiksen's (1962) analysis of proficiency tests for training evaluation.

3. Measure Knowledge	1. appropriate to assessing results of knowledge training. 2. Easily done.	1. Real objectives have to do with behaviors other than knowledge ability. 2. Ability to perform a task is not always related to knowledge of related facts and principles. 3. Lack of specificity in all areas of training outcomes except knowledge.	To the extent that the desired objectives of training have to do with performance, it is better to use measures of that performance as the basis for evaluation.
4. Elicit Related Behavior	1. Better than approaches 1, 2 and 3 because attempts to observe behavior. 2. Easier than evaluating behavior which more closely approximates the ultimate criterion.	1. Validity of criterion cannot be taken for granted because relationship of the related behavior to the ultimate criterion is inferred on the basis of logical relationships.	Stronger than approaches 1, 2 and 3 because the evaluator attempts to measure behavior. Measures behavior less directly than approaches 5, 6 and 7.
5. Elicit "What I Would Do" Behavior	1. Better than approaches 1, 2 and 3 because the evaluator does observe behavior of the type students are being trained to perform. 2. Easier than eliciting or evaluating behavior which more closely approximates the ultimate criterion of real-life behavior.	1. In multiple choice versions the trainee doesn't invent solutions, he chooses them. 2. Test-taking behavior can represent an attempt to choose a "correct" answer, not what the examinee would do. 3. Situations are too briefly described to present "real" problems. 4. May fail to get a "style" of behavior displayed in real life.	There is only one real answer to situational items, "It depends,"

6. Elicit Lifelike Behavior	1. Examinee behaves as if he is in a "real-life" situation calling for behavior of the sort he has been trained to perform. 2. Standardized the "real-life" situation. 3. Face validity is high if simulation is done well. 4. Method can measure objectives of attitudes stated in terms of behavior, not in self-report terms. 5. Allows evaluator to control his criterion variables. 6. A behaviorally related attitude variables can be successfully embedded in a total performance test. 7. Easier than observing "real-life" situation.	1. The examinee must not know the attributes of attitude to be scored if attitude measurement is part of the total performance test. Hence the approach is not effective for continued routine measurement of attitude. 2. More difficult than methods 1 through 5.	The type of measure recommended for first consideration in a training evaluation study is that which most nearly approximates a real-life situation, the "eliciting life-like behavior" approac

7. Observe Real-Life Behavior	1. This approach is the ideal criterion measure. Its validity can not be questioned.	1. Test conditions are not standardized. 2. Occurrences of behavior measured may be rare. 3. Criterion behavior may be private. 4. Costly in time and effort. 5. It may be hard to select and analyze relevant behavior aspects from all the matrix of behaviors. 6. Rating scales are often used because performance events are difficult to scale.	Psychometric problems are insurmountable.

much less. A random sample of hand transcribed data will reveal a much higher error rate.

Once data have been recorded (keypunched), manipulation of data by card sorter or computer allows for an almost unlimited number of data comparisons. Having this flexibility allows for efficient data summarization. Further, raw data can be stored for aggragation when additional data on the same variables are collected. Thus, data can be used as process information in a comparative sense. For example, data may be obtained from a number of typing training courses offered over time. A comparison of data collected during each training course will provide evidence of specific course effectiveness, thereby yielding feedback capable of being used for course modification.

A final advantage of machine processing of data is that the analysis of data may be efficiently accomplished drawing from a wide spectrum of statistical procedures. A good example of statistical procedures available on computers may be found in Veldman (1967).

Data analysis. Once the data are collected and processed, statistical analyses of the data may be performed. The nature of the statistical technique used to manipulate data is primarily dependent on two things: (1) the nature of the data collected, and (2) the questions being asked of the data. A good summary of assumptions underlying the most popular statistical techniques may be found in Guilford (1965).

The questions which are asked of training data are usually related to the adequacy of the training. Thus, questions such as "Did the training accomplish the desired objective?" help to determine, in part, what statistical test to apply to the data. If a training standard has been specified (e.g., 80 percent of the trainees will correctly respond to 80 percent of the measures), then the only statistical treatment necessary would be that of determining the percentage for each of the measures used. This is usually the case if criterion-referenced measures are employed. Since criterion-referenced measures are not designed to maximize variation, the use of inferential techniques, such as the analysis of variance (which have test variation as a basic assumption), would not be appropriate. Although there are some exceptions, in general, the use of most statistical techniques based on classical test theory are inappropriate with criterion-referenced measures. An adequate discussion of this point is presented in Popham (1971) and Nitko (1972).

Data reporting. The one major requirement of data reporting is that the data be summarized in such form so that any reader can immediately relate the data to the questions posed. It is important, therefore, that data be relevant, concise, and clearly displayed. To satisfy this requirement, users of data should help to determine what their needs will be.

Community Development Training--The State of the Art

Assumptions

General acceptance has been afforded the concept that the basis for training and education programs rests in adequate identification of needs - or by performing needs assessment. Thus, the *Survey of Training Needs and Evaluation of the 1970-1971 Title VIII Training Program* (Texas Municipal League, 1972) served to perform this function for the State of Texas. One objective of the report was "...identifying training needs in Texas municipalities (p. 1)." The conclusion of the report is that "justification for training is self-evident (p. 1)." The rationale for this conclusion includes:

1) The impetus for expanded training programs for Texas municipalities is found in the needs of the State's towns and cities. Total population growth and changes in population patterns are indicative of burgeoning urban needs and problems (p. 2).
2) Response to urban issues has been multi-faceted, and one facet of this response is heightened emphasis on upgrading the skills of public policymakers, managers, technicians, and workers (p. 2).

The primary data which support this rationale are responses to a survey designed to identify specific training needs for municipal officials. These data are forecasts of training needs by previous course participants and city officials. A summary of the specific findings and recommendations made by TML follows:

> Inadequate post-entry training is a stumbling block to effective municipal government in Texas. The problem has stemmed from limited budgets at the local level and unchanging resources for a cohesive, coordinated effort to formulate effective statewide programs that are tailored to identified problems.
>
> Municipal government growth...will accelerate an already serious problem. More and better educated administrative, professional, and technical (APT) personnel will be required for city operations, and much greater demands will be made for keeping the skills of APT employees in

middle and upper echelon positions current. The rapid changes in techniques brought about by the application of increasingly advanced technology lends even greater importance to the latter point.

Needs vary from city to city, depending on size, the peculiarities of the local economy, level of services offered, and other factors. The dominant aspect of differential needs, as related to the rudiments of APT functions, is size. The degree of specialization in personnel skills accelerates with the size of city population and government structure, and the scope and diversity of government functions.

Smaller cities must depend on generalists - city secretaries and managers backed by little or no administrative, professional, or technical staff. Budget limitations and the practical job requirements for "minding the store" inhibit participation in extensive and expensive training programs held in distant locations. Alternative information channels, such as professional associations, are a useful source for upgrading skills, but these sources are usually pointed toward the esoteric techniques of specialized subject matter and are often not directly transferable to small city needs.

At the other end of the spectrum, large cities are as complex as any institution and must have access to the highest level of skills prevailing in the state of the art of any subject matter or techniques related to the provision of municipal services (pp. 12-13).

Apart from the obvious subject matter priorities...the most salient feature of the analysis of future training needs is the variance in priorities assessed the various topics by participants from the three population brackets in which data were aggregated. The survey seems to confirm Phase I survey findings that the immediate needs of smaller cities, particularly as related to APT personnel, include generalist skills in management and administration.

On the other hand, larger cities indicate needs for more sophisticated training in areas that have only recently evolved as concerns for municipal government. Housing needs, community development, human resources and urban technology are all illustrative of emergent trends in cities as opposed to the more traditional functions and services conducted in metropolitan areas. APT functions which might be considered part of traditional operations of cities were given low ratings, probably because most of the larger cities have developed a high degree of specialization and expertise in such areas as personnel management, general management and operations, public health programs, etc.

The major inference which may be drawn from forecast findings is that constant attention must be given to designing courses for different sizes and types of municipalities. The approved 1971-72 TML training program already reflects differential needs to some degree. An urban technology seminar and non-profit housing course oriented toward the larger cities is planned, and courses in small city administration and budget preparation will be conducted for the smaller municipalities. The remaining programs - code enforcement, community development seminar and case problems - cut across the board and will serve the documented needs of all cities. Future evaluation of training programs will be formulated to refine even further the distinctions in needs among different sized and types of municipalities (pp. 25-26).

The needs assessment summary reported by TML, presented above, does not meet the requirements of describing behavior discrepancies between how APT personnel are actually performing and an ideal level of performance. These requirements form one aspect of the DOES model and are best summarized by Kaufman (1972).

He points out that there are three necessary characteristics of a needs assessment. These are:

> 1) The data must represent the actual world of learners and related people, both as it exists now and as it will, could, and should exist in the future.
>
> 2) No needs determination is final and complete; we must realize that any statement of needs is in fact tentative, and we should constantly question the validity of our needs statements.
>
> 3) The discrepancies should be identified in terms of products or actual behaviors (ends), not in terms of processes (or means) (p. 29).

Although TML alluded to characteristic number 2 in their needs assessment report, the major focus of their study seemed to be aimed at identifying, at a general level, the areas for which training might be appropriate. Clearly TML does not meet the criteria presented above in their needs assessment study.

Constraints

As indicated above, a number of constraints are associated with Texas municipal training programs. Specifically, the general training needs vary according to size of community. In addition, the amount of "work hours training time" allowed is small, and also varies with the size of the community.

In general, the situation demands that training efforts be short and directed at the awareness level.

Levels of Training

If training courses developed for the State of Texas are based on TML's needs assessment, that information provided by the needs assessment is not specific enough to allow for the development of skill or knowledge level training. Although TML specifies that APT personnel need skill training there are no specific discrepancies reported which would warrant this recommendation. Further, the data presented by TML are not a form that would enable developers of training to specify adequate training goals and objectives.

Goals of Training

One of the major difficulties in formulating adequate training goals rests with the adequacy of needs assessment. Thus, the more general the needs assessment, the more general the goals statements tend to be. The recommendations made by TML are formulated on the basis of global data. These data, then, are not consistent with the stated goals of training, e.g., to provide skill training. As a result, the following three problems emerge:

1) Inadequate specifications of training objectives which are focused on producing observable behavioral changes;
2) Inadequate design of training programs which are capable of producing desired behavioral change; and
3) Inadequate criteria (standards/objectives) against which the success of training may be judged.

Objectives of Training

As such, formalized statements of training objectives are rarely found in Texas training courses. Most generally, when objectives are stated, they appear in the form of instructional objectives (Gronlund, 1970). An instructional objective is a general statement of which a class of behavioral objectives are a part. For the training of specific skills, instructional objectives stop somewhat short of specifying desired outcomes against which the success of training may be evaluated. Objectives must be stated so that the expected action or behavior of a trainee is specified along with the conditions under which the behavior will be performed and the standard of acceptable performance.

Statement of Need for the Evaluation of Training

Although the design of most training courses provides for some subjective or impressionistic evaluation, there exists a persistent need for performing evaluation focused on determining the adequacy with which goals and objectives are being achieved. In this respect evaluation must be concerned with more than a specific course. Adequate and effective evaluation is predicted on viewing training as only a small part of a larger system. Thus, for evaluation to be effective, all aspects of the system -- including comprehensive needs assessment, specification of institutional goals, analysis of job performance requirements, etc. -- must be related logically before evaluation of any part of that system can be performed. Once congruence among all elements of the system has been determined, the evaluation of training can take its logical and necessary position.

Summary

The purpose of this section has been to show the relationships between training and evaluation as reflected by the Decision Oriented Evaluation System. An overview of the state-of-the-art of training and evaluation revealed an increase in the level of sophistication in these areas. The amount of research and development in training and evaluation has increased rapidly in the past few years as is evidenced by substantial government spending. Yet it has been pointed out that much research is still needed to provide training and evaluation personnel an effective methodology with which to accomplish their goals.

The Decision Oriented Evaluation System is proffered for consideration as a tool in achieving training and evaluation goals. The system emphasizes the importance of specifying goals and objectives in observable terms based on systematic needs assessment and job analysis data. Further, the desirability of equivalencing levels of training to levels of evaluation is expressed.

A general training model (developed by the Air Force) and a general instructional system are presented along with guidelines to facilitate determining the effectiveness of an instructional system. In addition, specific procedures for evaluating training, including the advantages and disadvantages of these procedures, are presented.

In the last part of this section, an attempt was made to describe the state-of-the-art of community development training. The desirability of performing adequate needs assessment was emphasized along with conclusions regarding the constraints, goals, objectives, and evaluation of training in state supported programs.

Conclusion and Recommendations

Although the scope of an entire evaluation system far outreaches the scope of training evaluation, there is little substantive difference in the procedures necessary for effective and adequate operations. In each case, evaluation is focused on determining the degree to which specified goals and objectives are being achieved. The data used to provide this evidence are derived from making observations of behavior. From these observations, inferences regarding better or different methods for reaching specified goals or objectives may be made. Thus, evaluation is a process of identifying, obtaining, and using information to judge decision alternatives and an evaluation system is a set of procedures which provide valid and practical information to decision-makers for making program decisions and judging goal attainment.

It can be assumed that there is a necessary connection between needs assessment, training, and evaluation (as well as job performance and community impact) and that these elements form a system. One of the fundamental laws of a system is that it is only as strong as its weakest element. In a training and evaluation system, then, a weakness in any aspect of that system will have effect on the rest of the system. These points need to be considered, not only when systems are being defined and developed, but also as the system is operating.

The state of the art of both training and evaluation has not yet reached a level of precision necessary for unqualified recommendations. This is particularly true of a training and evaluation system. There are, however, some basic principles which can serve as anchor points for sound evaluation. These principles are:

(1) A needs assessment is the cornerstone of training and should provide information regarding the discrepancy between the "way things are" and "the way things should be".

(2) Goals for training should be derived from needs assessment information and should be stated in measurable terms.

(3) Instructional objectives and behavioral objectives should be derived from goal statements and should be stated in measurable terms.

(4) Evaluation of training should focus on the degree to which goals and objectives are being achieved.

(5) The discrepancy between actual achievement in a training situation and the specified objectives of that training will help form the needs assessment information base for further training development.

(6) The discrepancy between actual job performance level and desired job performance level will add needs assessment information for training development objectives.

(7) The desired job performance level should be specified in behavioral terms based on job task analysis.

(8) Job tasks should be related to and consistent with the goals of the organization in which they are performed.

(9) The goals and objectives of the organization should be stated in measurable terms and should be related to and consistent with the needs of the population the organization serves.

(10) All elements of a training and evaluation system, including needs assessment, training development and evaluation, job performance evaluation, job task analysis and community impact evaluation must be internally consistent in terms of goals, objectives, and job performance.

(11) All goals and objectives should be stated in measurable and attainable terms.

(12) Developers and evaluators of training should maintain close liaison throughout the training development and activity period.

(13) Evaluation should be designed into the training activity as a natural and preferably an unobtrusive event.

CATE Specific Implementation of Training Evaluation

Background

The procedures employed in implementing training evaluation for the Texas Department of Community Affairs began, initially, with an extensive specification and evaluation of the assumptions underlying Texas Department of Community Affairs Training activities. The specific model used in this effort was derived from Stufflebeam (1972), to which all elements of the training program were related. The following were considered major elements to be considered in the evaluation of training: (1) target population; (2) level of training; (3) length of training; (4) assumptions; (5) constraints; and (6) contact with developers. The training activity which was chosen to pilot test the Decision Oriented Evaluation System was "Principles of Supervision", developed and executed by the Engineering Extension Service at Texas A&M University.

Target population. The target population of the training course is basically "first-line" supervisors. Supervisors, from whom data were collected at the end of the training course, tended to fall in this category. Analysis of background data revealed that the mean age of the 21 participants was 34.5 years. Fifteen trainees were males and 6 were females. On the average trainees reported that they had been a supervisor for 5 years and they supervised, on the average, 14 people. Thirteen trainees reported that they were "office" supervisors and 6 trainees indicated that they supervised shop personnel. Most of the trainees (15) reported that they had attended at least one other supervisory training course. Six reported that they had attended no other supervisory training course.

Level of training. An evaluation of training materials revealed that this course was basically an awareness building-orientation type of activity. The focus of training revolved around the use of a "Discussionaire" which served to act as a topical guide for discussion by trainees. The material presented in the "Discussionaire" theoretically focused on the major principles and job functions of supervision with "adjustable" content so that the course would be able to adapt itself to the operation and needs of the group participating.

Length of training. "Principles of Supervision" is one of six supervisor training courses in Texas A&M University's Supervisory Development Program. Each course is described as a 15-hour course calculated to provide 90 hours of intensive management and supervisory training. Although it is recommended that the course be given for two hours a day over a work week period, this particular course was given in two consecutive days for about the same total number of hours.

Assumptions. One of the basic assumptions initially held about this course was that the training objectives were derived from job analyses resulting in skill development; however, further information revealed that the course would only provide information and orientation about Principles of Supervision. A second assumption, based on information provided by developers based on their past experience, was that trainees involved in courses of this nature would have a relatively low education level. This proved not to be the case in the pilot test. A third assumption underlying the evaluation design was that all topical areas in the "Discussionaire" would be covered by the course. This did not occur.

Constraints. The major constraints impinging on the evaluation of the "Principles of Supervision" course stemmed from two sources: (1) a lack of clear specificity of training goals and objectives; and (2) a lack of complete training materials and guidelines related to course activities. These two features coupled with the fact that skill training (although this was not the objective of the course) was not provided, limited the effectiveness and adequacy of the subsequent evaluation design.

Contact with developers. At all points during the design of the evaluation, close contact was maintained with members of the training staff at Texas A&M University. The final evaluation design was based on the efforts of the developers and evaluators in a collaborative relationship. The following major issues were identified and resolved as a function of this relationship: (1) identification and specification of course goals and objectives; (2) criteria selection; (3) item development; and (4) application of items. The following is the interpretation of objectives for Supervisory Training Program #1, "Principles of Supervision".

(1) Goals and Objectives--Identification and Specification

Cognitive Outcomes

1. The trainee will demonstrate his understanding of the broad role of the supervisor as it relates to management and workers.
2. The trainee will demonstrate his understanding of the basic principles of management and supervision.
3. The trainee will demonstrate his ability to apply principles of management and supervision in a "simulated" work setting.

Affective Outcomes

4. The trainee will demonstrate a preference for the role of the supervisor as presented in the course

(see objectives 1, 2, 3).

5. The trainee will express a desire to improve himself as a supervisor and will take action to that end (see objectives 1, 2, 3).

Definition of Terms

A. Understanding:

Objective #1 - ability to discriminate among relevant and non-relevant items related to supervisor's role.

Objective #2 - ability to differentiate among duties of supervisor manager in terms of ranked priority.

B. Apply:

Objective #3 - ability to select an appropriate principle and indicate appropriate point of application.

C. Preference:

Objective #4 - expresses statement indicating that he values the position of the developer.

D. Desire:

Objective #5 - seeks out materials to improve self as supervisor.

(2) Evaluation Criteria for Objectives of the Supervisory Training Program #1 - Principles of Supervision

Principles of Supervision Items

Given a list of 14 principles of management and supervision, 80% of the trainees will select (identify) correctly at least 70% (10) of those principles which are basic or irrelevant to supervision.

Correct identification is defined as the number checked correctly plus the number left unchecked correctly. A criteria of 70% is equivalent to 10 correct choices out of 14 possible.

Job Functions Items

Given a list of 22 job functions relating to (management), supervision production, etc., 80% of the trainees will select (identify) correctly at least 70% (15) of those functions related or unrelated to the broad scope of supervisory function.

Correct identification is defined as the number checked correctly plus the number left unchecked correctly. A criterion of 70% is equivalent to 15 correct choices out of 22 possible.

Application of Principles in Situations Items

Given brief descriptions of six situations requiring the application of principles of supervision and management, 80% of the trainees will be able to select (identify) from a list of 8 to 10 alternatives for each situation at least 70% (40) of the most effective, least effective, or neither effective or ineffective ways of dealing with the situations.

> Correct identification is defined as the number checked correctly plus the number left unchecked correctly. Minimum score is 9 (16%); maximum score is 57. A criterion of 70% is equivalent to 40 correct choices out of 57 possible.

(When test data were processed, the correlations between the scoring procedure outlined above and the traditional procedure of scoring correct responses only were: (1) 0.23 for the sum of Principles of Supervision Items, (2) 0.82 for the sum of Job Function Items, and (3) 0.87 for the sum of the six Situation Items. The low correlation for Principles of Supervision Items can be attributed to a lack of variation in the items - typical of a criterion referenced measure.)

Pilot Test Development

After agreement was reached by Texas A&M and CATE staff members on the Principles of Supervision workshop objectives, items related to these objectives were developed. The "Discussionaire" used in the workshop formed the primary content base from which each item was derived. A second content source was the course outline.

Item development. Based on an agreed upon format, items were developed for three evaluation sections: (1) Principles of supervision, (2) Job functions, and (3) Application of supervision principles in situations. These items, in their original form, are displayed in Appendix E. Texas A&M staff members reviewed the items and suggested that the "readability" level may not be appropriate for a typical population of workshop trainees.

Subsequently, each section of the evaluation instrument was analyzed for readability level using the Dale-Chall readability formula (1948a, 1948b). The work sheet used to determine readability is displayed in Appendix F.

The results of the analysis indicated that items for: (1) Situations 1, 2, 4, and 6 were inappropriate below the 7th grade level of reading; (2) the demographic information and Situation 5 were inappropriate below the 9th grade level; (3) Principles of Supervision items and Situation 3 were inappropriate below 11th grade level; and (4) Job Functions were inappropriate for other than college graduates.

Using the readability analysis as a guide, the evaluation instrument was revised so that each section and situation had a readability level below the 9th grade. It was assumed that some of the "job-related" words considered to be relatively difficult for a general population would be understood by supervisors attending the workshop. The final version of the Principles of Supervision evaluation instrument is displayed in Appendix G.

Correct choice identification. To determine the correct choices for items in each of the sections of the evaluation instrument, instructors of the Principles of Supervision course were asked to independently judge the correct choices. Seven instructors participated in making these judgments.

For the Principles of Supervision items, 6 of the 7 selected Items 2 and 13 as the most important principles. All 7 of the judges did not check Items 5, 7, 8, 10, 12, and 14. The rest of the items were selected by 1 to 3 judges. Items 2 and 13 were selected to represent correct choices for this section of the instrument.

For the section on Job Functions, at least 5 out of 7 judges selected the following job functions as those jobs a supervisor should do: Items 1, 2, 3, 4, 5, 6, 17, 18, 19, 20, and 22. These items were selected as correct responses. All 7 raters did not make responses to Items 7, 9, 10, 12, 13, 14, 15, and 16. From 1 to 3 judges checked Items 8, 11, and 21.

For the third section of the evaluation instrument, Situations 1 through 6, the matrix in Table 6 summarizes the number of judges selecting the positive and negative alternatives for each of the situations.

Insert Table 6 about here

The degree to which the Texas A&M staff agreed on the importance of the Principles of Supervision and the Job Functions items indicates that there is relatively high inter-judge agreement regarding the correct choices for these items. It would appear then that these two sections of the evaluation instrument have at least content (or face) validity. This is not the case with the situations. As can be seen from the matrix of responses in Table 6, agreement was obtained on only 3 of the 6 situations (#2, #3, and #5). In Situations #1, #4, and #6 it can be seen that there is high agreement on 3 of the alternatives. The rest of the alternatives are about equally desirable or undesirable. On the basis of the above results, it was concluded that correct responses for an item would be defined in terms of the number of judges selecting that item. An item was defined as a correct choice if 4 or more judges selected that item as a correct choice.

Analysis of Data Obtained from the City of Austin Supervisors

Data for 21 protocols were coded and key-punched. Using the Texas A&M staff responses as indicators of correct responses, each of the trainees' instruments were scored for 3 variables. Variable #1 is the sum of correct responses for the Principles of Supervision, variable #2 would be the sum of correct responses for Job Functions, and variable #3 would be the correct responses for the 6 Situations.

Correlation analysis. The 3 instrument variables were correlated with the 6 background variables, and 6 of the intercorrelations were significant:

TABLE 6

Matrix for Number of Judges Selecting

Each Alternative for Each of the Six Situations

ALTERNATIVES

SITUATION	1		2		3		4		5		6		7		8		9		10	
	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
1	7*		1	1	3					7*	1				2			6*	—	
2			5*			1		4*		3	1	2	3		4*		1			4*
3	6*			6*			3					1		1			5*			6*
4		2			1		1	2		2		7*		1	5		7*			
5	3			4*	4*			2		7*	1		5		1	1	—			
6	4*			6*		3	1			1			7*			1	1	3	1	

Note.--* indicates that these are the correct choices.

1. Older trainees tended to have more years of supervisory experience ($r = .42$; $P < .05$).
2. Females tend to supervise more people than males ($r = .54$; $P < .01$).
3. Females tend to supervise White Collar work and males tend to supervise Blue Collar work ($r = -.46$; $P < .05$).
4. Supervisors of White Collar work tend to have had more supervisory courses than supervisors of Blue Collar work ($r = -.52$; $P < .05$).
5. Blue Collar supervisors tend to have a higher score on Job Functions than White Collar supervisors ($r = .56$; $P < .01$).
6. Trainees who scored high on Principles of Supervision tended to score low on the six Situations ($r = -.43$; $P < .05$).

Evaluation of course objectives attainment. In addition to the correlation analysis, frequency distributions were obtained for trainees obtaining a given Raw Score (see Table 7). At least 80% of the trainees responded correctly to at least 70% of the items for both Principles of Supervision and Job Functions. This was not true for the Situations; only 52% of the trainees responded correctly to at least 70% of the items.

Conclusions. In general, responses to the Principles of Supervision and Job Functions sections of the evaluation instrument indicated that the workshop adequately covered these topics. The major problem noted for these sections was that there were only two correct items to be checked on the Principles of Supervision items, suggesting that an adequate sampling of items relevant for this domain was not made. It is notable, however, that trainees were able to correctly discriminate on the items for these first two sections of the evaluation instrument.

The degree to which trainees were given the skills to apply their knowledge (at least in a paper and pencil simulation as reflected by the six situations), however, appears to be less than desirable. If the evaluation criteria for the objectives of the workshop are adequate, then it might be concluded that either the six situations were not related to the material presented in the workshop, or the correct choices for the situation items were inappropriate.

Application of Decision Information Summary to Pilot Test Data

Based on the data obtained for the Principles of Supervision workshop, judgments regarding the training were made and are displayed in the Decision Information Summary Training Process Evaluation (Figure 4). The display of these judgments, based on available data and observation of the course, give rise to the following hypotheses: (1) The test instrument may have been inadequate for measuring course outcomes; (2) the time and conditions of administration of the test instrument may have negatively influenced trainee performance; (3) the course may not have adequately dealt with the written objectives and the test items; (4) there may have been insufficient opportunity for trainees to practice the behaviors required by the test instrument. The conclusion reached is that any or all of the following -- course objectives, course delivery, test instrument and test administration -- should be modified and re-evaluated before final judgments are placed on the efficacy of the course or the evaluation procedures.

The hypotheses noted above are derived, in part, from the following information: First of all, it needs to be pointed out that the Principles of Supervision course is the first in a sequence of six courses designed for experienced and/or novice supervisors. Final judgment on the efficacy of the courses really should await administration of the entire sequence to the same target population. Only in that way can the ultimate objectives of the course be verified. Secondly, the objectives derived for the course may not have directly corresponded to the objectives of the instructor; although the particular instructor did participate in the verification of the initial objectives of the course, we do not have any evidence that he actually subscribed to the final objectives and/or the test items. Three, the training population for this course was atypical of the population for whom the test instruments were developed. The test items were particularly directed toward predominantly male, public utility -- public service oriented supervisors with a maximum of a high school education and sometimes less. It is important to note that the test items themselves were written not to exceed a ninth grade level of reading ability. It was also impressed upon the test developers that many of the trainees attending the course would undoubtedly be unable to read or write.

The actual trainees for the course were atypical from the population expected based on the experience of the course instructors. First of all it is important to note that 25% of the trainees were women. Sixty-six percent of the trainees were employed in social service agencies, largely funded from federal sources, and dealing with far different situations than those presented in the case study type items. It is further important to note that more than 50% of the trainees were at least college graduates. Several of them had graduate training. The point to be made very clearly is that the test was developed for a far different population than that which actually attended the course. The nature of the test, the nature of the delivery of the course may in some way account for the performance noted.

It should also be pointed out that the test administration conditions were not optimal. First of all, the test was added on to the natural schedule for the course, and therefore consumed twenty-two minutes of course time that would ordinarily have been directed toward the course objectives. Some of the actual activities planned for the course were not conducted due to the press of time; this may have affected trainee performance on the test instrument.

Of more particular importance to test results was the fact that the test was administered orally by the instructor. That is, he read each item and each response for the trainees. In order to complete the test in a reasonable amount of time, the instructor read the items very rapidly. At one point during the course of the administration, one of the highly educated female members attending the course asked if the instructor would please not read the items and let the trainees read and think about them. She noted that she was being too hurried in having to respond to the test items and was not able to think about the responses to the test and further than the instructor's reading of the items were interfering with her thinking processes. At that point, the instructor asked the entire group if he should continue in the manner that he was pursuing or whether he should stop and let the trainees read and respond to the items themselves. The instructor asked for a show of hands and slightly more than 50% of the trainees indicated that they wanted to continue with the test administration under the conditions that were being followed. This mode of test presentation clearly disturbed several of the students. The observers seated in the back of the room were able to detect observable body behavior which indicated dissatisfaction with the way in which the test was being administered.

In summary, it is premature to place any final judgment on the effectiveness of the first course in the sequence of supervisory training courses. The evaluators would recommend that the test items be reviewed with respect to their potential fit to a more typical training population. It should further be pointed out that the test instrument was developed without having observed the course in action. In the future it would be wise for evaluators to attend a course prior to attempting to develop either behavioral objectives or test items for that course. Since the trainees, representing a rather high educational level group, failed to perform well on the application of principles part of the test, it may mean that insufficient opportunity was provided for them to practice these kind of behaviors required for the test, thereby requiring that the course deal more directly with this type of cognitive behavior if indeed this is the intended outcome. It further needs to be kept in mind that the ultimate objective of this series of courses is improved performance as a supervisor. At best, a paper and pencil test can only approximate situations in which principles of supervision would be applied. It tells us nothing about how an individual would actually behave in a given situation. In short then the most optimum way to evaluate a course of this type would be to put the trainees in a situation where they would have to, by role playing at a minimum, display the types of behaviors that the course intends to transmit to them. In final summation, much more work is warranted on the evaluation of this course, and maybe even course delivery in order to make the evaluation of the course more congruent with its immediate and ultimate objectives.

JOB PERFORMANCE EVALUATION

The past three decades have seen a growing awareness of the need for training evaluation and the development of human performance measures that congruently and consistently reflect the outcomes of training. The massive training requirements of World War II and the subsequent explosion of technology with the production of man-machine systems of higher and higher complexity have produced an urgent need to study and measure human performance. This growing complexity in technology has produced a concomitant complexity in both training and performance evaluation. One might conclude, given the urgency of performance evaluation and present-day research and development resources, that problems of evaluating on-the-job performance would have been for the most part solved. Such is not the case. Most of the research in measuring human performance has been aimed at the development of criteria for the validation of selection variables and not for the evaluation of the efficacy of training. Wilson (1962) and Frederiksen (1962) in their thorough analyses of the problems involved in the measurement of human performance as it relates to training have recognized this deficiency in the area of training research. The training developer is confronted more and more with the pressing need for adequate criterion measures to evaluate outcomes of various instructional treatments in order to choose those which produce the best results. Frederiksen (1962) states:

> The homemade tests and course grades which used to be thought satisfactory are now seen to be inadequate. Criterion measures which more accurately reflect the objectives of instruction and

which permit judgment to be made separately about various aspects of the teaching program are needed.

Wilson (1962) would even put performance evaluation before training development. He states:

> After all, one would reason, there is no way of knowing how to train people unless you can measure, first of all, how they perform when they are finally assigned to a job.

The amount of performance measurement research compared to the amount of training continues to be small. By far, most of this research has centered on the use of ratings and other gross measures. Only isolated attempts have been made to come to grips with real problems of measuring how well a man performs the actual task for which he has been trained. Beyond ratings, the vast majority of research reports on training assessment has embodied the more conventional approaches of classroom measuring instruments as the means of assessing training. The use of on-the-job performance measures has been rarely adopted, and, except for the armed services, there has been little strong interest in research and development in the area of practical performance measurement for training evaluation.

There are two major reasons for the lag in development of performance methodology. First, this area of personnel research has been dominated by the quest for selection criteria. Development of rating scale methodology has provided measures of marginal, but sufficient, validity for the evaluation of selection variables. Second, the cost of performance testing is high. Performance tests are costly to build and costly to administer, requiring the measurement of one person (or few at most) at a time. Because of these costs training evaluators have typically fallen back on the use of rating scales and written tests since these can be used with groups. From the perspective of developing effective training the trade-off involves validity per unit cost; that is, whether to develop and use highly valid but costly performance measures or inexpensive but questionably valid gross measures. The question remains unanswered in any general sense, but will depend on the constraints, value and need for precision of the particular training under consideration.

Performance Measurement - State of the Art

(General)

The basic role of performance measurement is to provide feedback information on how well a man performs his job to those responsible for his training both in training courses and on the job. In conceptualizing the performance measures as a kind modifying feedback information, in addition to the requirements of reliability and validity, Wilson (1962) derives three requirements from principles of human learning (McGeoch and Irion, 1952):

1. The measures must be quite specific. In order to be effective they must identify specific aspects or elements of the job so that both trainer and trainee may take action to improve performance by improving these elements.
2. For maximum utility the measures must be available to the trainer and trainee soon after the performance.
3. Performance should be measured often, for by doing so the amount of reinforcement provided is increased with a consequent increase in the speed of learning toward the desired level of performance.

Because requirements two and three are problems for training and evaluation administration rather than characteristics of criterion measures, Wilson's study deals largely with the issue of specificity.

State of the Art of Job Performance Criterion Measures

Frederiksen (1962) discusses approaches to obtaining training evaluation measures that are also relevant to the art of job performance evaluation. He covers, for example, the advantages and disadvantages of soliciting opinions, administering attitude scales, measuring knowledge and elfciting behavior. The following list of the various approaches to job performance evaluation was synthesized from the works of Wilson (1962), Frederiksen (1962), Flanagan (1954) and Flanagan and Miller (1955 a, b, c, d). Each approach is accompanied by a brief description of the current state of the art for that particular criterion measure with special attention paid to the problems of specificity, nearness to "real world" performance, cost and psychometrics. (A tabular treatment of the same state of the art is presented in Table 7.)

1. Solicit Opinions. Job performance evaluation may be done by soliciting an opinion of the quality of the performance from either the worker's peers, his supervisor or an expert observer. The evaluator may solicit a descriptive opinion or an opinion structured by an instrument designed to measure the observer's impression or his observation of the trainee's behavior. The two instruments most often used are rating and performance checklists.

    a. Rating scales are widely used because of their low cost, but they have little else to commend them. As defined by

TABLE 7

Job Performance Criterion Measures*

Type of Criterion Measure	Specificity	Nearness to "Real World" Performance	Psychometric Problems	Cost	Conclusion: Suggested Areas of Utility
Operational Performance Measures					
1. Tangible Products Measures	Provide much specific information when available	Measures "real world" products	Variable performance of equipment; evaluation by judgement rather than measurement; aesthetic products hard to measure	High; measures one trainee at a time	Use when reliable observers' judgement can be shown to reflect the variability in trainee performance
2. Measures of specific behavior elements	Adequate when measure based on checklist of specific behaviors	Measures "real world" performance	Sampling errors, observer variation, time sampling	High; measures one trainee at a time	Use for trainee whose equipment does not turn out a product
3. Gross performance measures	Fails to provide specific data	Measures "real world" performance	Many uncontrollable or unmeasurable variables	High, but lower than 1 and 2	Useful for decisions to continue or terminate training if reliability can be established
4. Inferred positive performance measures	Even less specific than 3	Further from "real world" than 1-3	Many uncontrollable or unmeasurable variables	High, but lower than 1 and 2	Useful for measuring employee morale

5. Malperformance measures	Inadequate	Negative end of performance measures 1-4, thus nearness to "real world" is highly variable	Variable. Can include all of above problems	High, but lower than 1 and 2	Now lacks specificity needed for training evaluation
Work Samples	Provides adequate specificity	Approximates "real world" less than Operational Performance Measures, more than ratings	Difficulty in reproducing tasks; variable equipment performance; obtaining adequate sampling; reliabilities range, .52 to .93	Variable, but usually high	Useful for training evaluation if reliable and representative of real tasks
Ratings	Inadequate	Wider departure than all of above measures	"Halo" effect; lack of skill or opportunity to observe	Low	Offer little to training evaluation

* Table 7 summarizes Wilson's (1962) analysis of job performance criterion measures.

Wilson (1962), "cumulative impressions or evaluations made by an observer and recorded at a time later than the observation . . . ," they are seldom designed with sufficient specificity to provide feedback to training design. Taylor (1958) suggests that the opportunities for observation seldom occur and that observers often lack the skill for effective observation. Thus rating scales are at best measures of impression. Because of their low cost, they are widely used nevertheless. In such cases they can be made more specific, objective and realistic if carefully referenced to the tasks performed on the job by trainees.

b. Performance checklists are often more structured as criterion measures than are rating scales allowing the observer to attend to specific task elements and providing an externalizable scale for direct observation.

2. Administer Attitude Scale. If the objectives of a training program include changes in the trainees' attitudes, the evaluator may simply ask trainees to what extent they have adopted the desired attitudes, a method that includes all the drawbacks of soliciting opinions. A more sophisticated approach is to administer an attitude scale on which all items "are relevant to a single factor and contribute to a single score . . . ." (Frederiksen, 1962). The method is easily administered, hence relatively inexpensive, but is susceptible to bias due to the trainee's response set. The bias can be corrected to a degree by the "forced choice technique." For data of sufficient specificity for feedback to training,

attitude scales should measure the trainee's attitudes in terms of changes in his behavior, but there is little evidence that scores on attitude scales are correlated with behavior to any marked degree. (Frederiksen , 1962).

3. Measure Knowledge. Although the art of evaluation is highly advanced at assessing the results of knowledge training, program objectives that anticipate a transfer of training to on-the-job performance must be stated in terms of behavior. Knowledge tests assess knowledge, not behavior or task performance; they do not provide the type of data that can be used to assess the efficacy of any training other than knowledge training. (Frederiksen, 1962).

4. Elicit Behavior. Because behavioral objectives and outcomes are prerequisites of effective training, evaluation also should be based on the observation of behavior as it occurs in the "real world" or as it can be elicited from trainees for the specific purpose of evaluation. Because of psychometric problems involved in observing "real" behavior, cited by Taylor (1958) and mentioned above, the evaluator can elicit behavior from trainees that can be structured in the following ways:

a. Eliciting Related Behavior. Bases evaluation of performance on the observation of behavior that is logically related to the "real behavior that is in some way difficult to observe. Frederiksen illustrates the method with the evaluation of writing performance ("real" behavior) based on rewriting or editing exercises (related behavior). The evaluator is attempting to measure behavior but can not be sure of the validity of his criterion measure, which is related to "real" behavior solely on the basis of logic.

b. Eliciting What I Would Do" Behavior. Presents problem situations for which the trainee provides solutions; thus the evaluator can observe behavior of the type the trainee performs in the "real world," but, as Frederiksen suggests, the only accurate answer to such items is "It depends." If the instrument presents a multiple choice the trainee chooses solutions rather than invents them; in any case he probably chooses a "correct answer," not what he would do if performing on the job.

c. Eliciting Lifelike Behavior. Attempts to observe the examinee's behavior performance as if he were performing in a "real life" situation. Implementation of the method varies from pen and pencil to situational items. It is preferable to knowledge tests, attitude scales and opinion solicitation because it is based on the observation of behavior, in fact it more nearly approximates on the job performance than the methods of eliciting behavior mentioned above. The only method nearer to "real life" behavior in which psychometric problems are insurmountable. In short, given the current state of the art, eliciting life like behavior is the best method of evaluating the transfer of training to job performance. Frederiksen (1962) calls it the method "recommended for first consideration as a measurement technique." Wilson (1962) describes work samples, which are one way of eliciting life like behavior, "very valuable aids in the measurement of job performance."

7. Observing "Real Life" Behavior. This is the most "real" of criterion measures, but it is also beyond standardization. The occurrences of the behavior for which measurement is sought may be rare, making the method very costly in time and effort; when the behavior occurs it can not be standardized. The methodology provided by Flanagan (1954) and Flanagan and Miller (1955, a, b, c, and d) has provisions for observing, recording and analyzing "real life" behavior. While this is short of standardization and measurement, it nevertheless provides a powerful tool with which one can construct variables that can be valid and consistent measures of job performance.

In sum, the evaluator should observe behavior that is as nearly "real" as possible in order to obtain data of a degree of specificity sufficient to provide feedback to training design. The state of the art of job performance evaluation makes eliciting "real life" behavior the best method for measuring the transfer of training to job performance.

Perhaps the best method of eliciting life like behavior is the performance test. Four exhibits (A through D) of performance tests, reproduced from a manual of performance tests prepared for the U. S.

Navy (Mackie, et al, 1953), are presented as good examples of instrumentation and measurement of specific task performance. Each performance test exhibit includes a description of the test, the scoring method, evaluation of the test, statistical results, and a specimen of the test itself.

Exhibit A, Circuit Trouble-shooting, and Exhibit B, Ground Testing, are performance tests for Navy electricians' mates. Both A and B use actual equipment and instruments the men trained would use on the job.

Both elicit troubleshooting behavior from the trainees. One interesting aspect of the performance tests in A and B is that the conditions of performing are under the examiner's control; that is the examiner can manipulate both the difficulty and kind of performance required. The performance itself is under the trainee's control and is explicitly observed and scored. The conditions of observing and testing permit not only objective and explicit measurement, but immediate diagnosis and feedback to the trainee. Thus, performance tests become powerful learning tools.

Exhibit C, Use of Common Hand Tools, is not strictly a performance test in the same sense that A and B are. However, it is much more than a simple tool naming test as it requires the actual selection of the appropriate tool to perform specific tasks. Thus, the trainee must understand the job task he is faced with and relate the correct tool to it by name. The test is practical being directly related to job performance requirements and affords the opportunity for direct learning by the trainee.

Exhibit D, Transmitter Tuning, is what can be called a procedural check-list performance test and illustrates another approach to performance testing. Like the previous performance tests the test shown in D utilizes the actual equipment and all the tasks demanded on the job. The performance of the task required by the test in D is sequential, each step being critically dependent on the one before it. If the trainee makes a mistake the examiner gives him feedback by prompting him. Thus, the examiner insures that each step is finally performed accurately. The trainee is scored objectively on the number of correct steps executed in the task performance and can be diagnosed on the spot for any special difficulties he is having.

EXHIBIT A

CIRCUIT TROUBLE-SHOOTING

Description

The equipment for this test consisted of a lighting circuit mounted on a bulkhead. While the cables were shorter than would normally be found aboard ship, the circuit units and wiring were essentially the same as standard shipboard circuits. Two opens, a ground, a short, and a blown fuse were put into the circuit.

Using hand tools, a voltage tester, and a megger, the examinees were required to locate the casualties in the circuit. They recorded their performance by placing an X at the location of the casualty on the circuit diagram (see recording form, page 25) and by writing in the name of the casualty, (short, open, ground, or bad fuse).

Scoring

Two points were given for each casualty correctly located and named. One point was given for indicating a branch of the circuit that contained a casualty (without locating it precisely within that branch) if the casualty were correctly named. The total possible score was 10.

It was necessary to score the tests in this way because of the examinees' methods of working. Beginning with the 10 wire connection box, they first determined which branches of the circuit contained casualties, and then traced them down, isolating them within the branches. Frequently they could determine which branch contained a casualty but could not determine its exact location within that branch.

EXHIBIT A

Reliability

Alternate forms of the test were constructed and administered to 60 examinees. Form B was administered four days before the administration of Form A. The distribution of scores on Form B was highly positively skewed with a mean score of 2.9 and a median score of 1.9. The distribution of scores on Form A more nearly approached normality with a mean score of 4.5 and a median score of 4.3.

The correlation between scores on the two forms was .50, which is regarded as a conservative estimate of the reliability, because of the following factors which may have contributed to the unreliability:

1. The tests were administered to the trainees in the last week of the EM School course after they had completed the school's final written achievement and final performance examinations. The examinees felt that their performance on this test would not affect their school standing, and consequently, motivation was low.
2. Changes in the nature of the casualties from one test administration to the next and from one set of equipment to another. Although the Navy personnel assisting in the administration of the tests were interested in testing and conscientious in their work, they often could not see the necessity for making the casualties identical from one test administration to the next and from one set of equipment to another. (There were five identical sets of equipment for this test.) As a result, project personnel could not always be sure that the examinees were working on comparable sets of equipment.

EXHIBIT A

3. Changes in the casualties as a result of the work of the examinees. It was observed that additional casualties occurred in the circuits as a result of errors by the examinees. The circuits were energized, and it was possible for the examinees to burn out a fuse while they were working. This problem was corrected after the test had been administered a few times.

Evaluation

A large percentage of the Electrician's Mates' work aboard ship consists of trouble-shooting electrical circuits. This test demands the same type of performance that is required in the practical situation. Consequently the test served not only as a measure of achievement but also as an aid to training.

The test was at first a difficult one for the EM School trainees. The distribution of scores on Form A was highly positively skewed. Over a period of four classes, during which time mean scores increased from 2.2 to 3.0, the distribution became more symmetrical.

In the interests of simplicity and economy, the diagram of the circuit the examinees were to trouble-shoot was also used as the recording form. This approach to recording performance may have served to reduce the reliability of the test, since it was difficult in some cases to determine exactly where an examinee thought the casualties were located in terms of the X's he marked on the diagram. It might have proved better, for example, to list the units of the circuit in a column at the left of the page and the possible casualties across the top. The examinees could then

EXHIBIT A

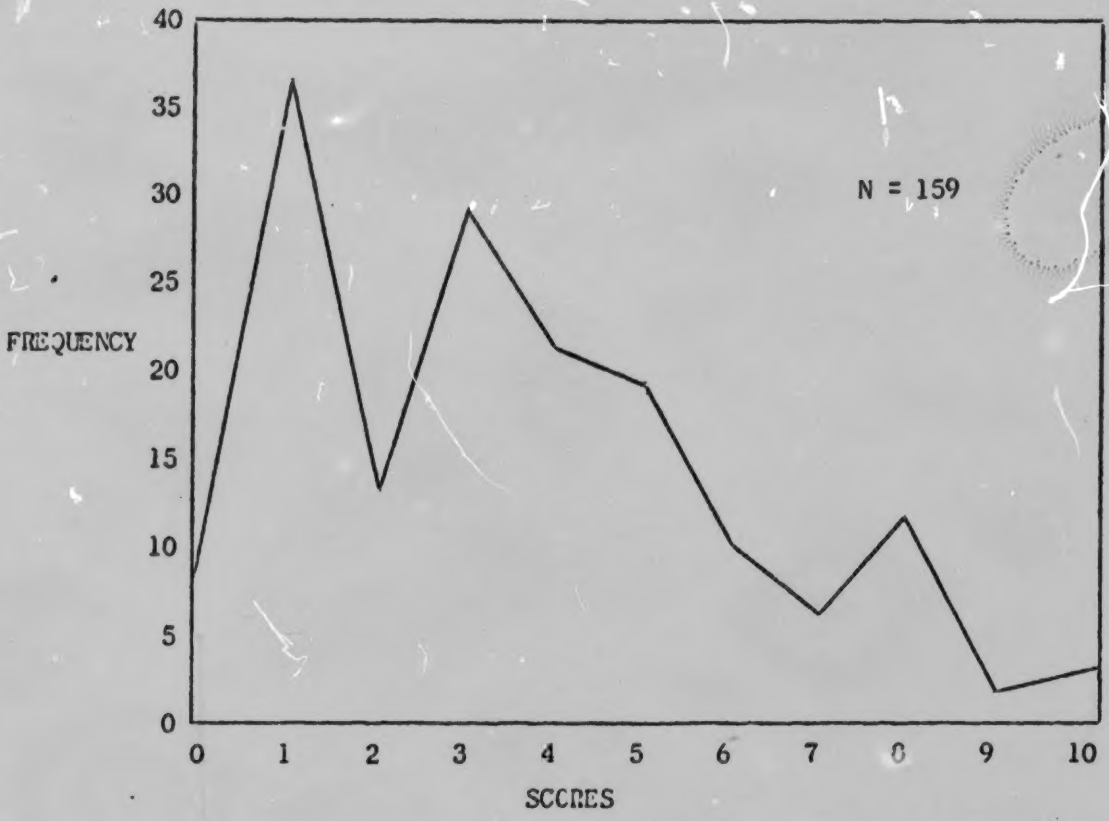
have recorded their performance by placing X's in the appropriate cells.

Scores on the Circuit Trouble-Shooting test correlated with scores on other tests in the battery from .15 to .44, the highest being with Controller Trouble-Shooting scores. The scores correlated .35 with final class standings (N = 159). The correlations with General Classification and Mechanical Aptitude test scores were .04 and .15, respectively, (N = 140).

EXHIBIT A

TEST RESULTS

CIRCUIT TROUBLE-SHOOTING



RAW SCORE RESULTS

Mean = 4.2

Median = 4.0

S.D. = 2.4

RELIABILITY

Alternate Form: .50

EXHIBIT A

TEST MMRC 105 B2 DC:__________ PLUS SCORE:______

SEPTEMBER 1952 MHC:__________ MINUS SCORE:______

NAME:____ RATE:______ CLASS:______

CIRCUIT TROUBLE SHOOTING

Directions: THE CIRCUIT IS ENERGIZED. BELOW IS A DIAGRAM OF THE CIRCUIT. WHEN GIVEN THE WORD BEGIN, YOU WILL LOCATE AS MANY SHORTS, OPENS, OR BAD FUSES IN THE CIRCUIT AS YOU CAN. IF THE CIRCUIT IS GROUNDED, LOCATE THE SOURCE OR SOURCES OF THE GROUND. INDICATE ON THE DIAGRAM WHAT FAULTS YOU FIND AND WHERE THEY ARE. YOU MAY DISCONNECT ANY OF THE WIRES OR REMOVE THE FUSES. DO NOT CORRECT ANY OF THE FAULTS YOU FIND. AFTER TIME IS CALLED YOU WILL REASSEMBLE THE EQUIPMENT AND LEAVE IT JUST AS YOU FOUND IT.

DO THE WORK JUST AS IF YOU WERE ABOARD SHIP. OBSERVE ALL SAFETY PRECAUTIONS AND STANDARD PROCEDURES. ARE THERE ANY QUESTIONS?

Time Limit: TWENTY MINUTES

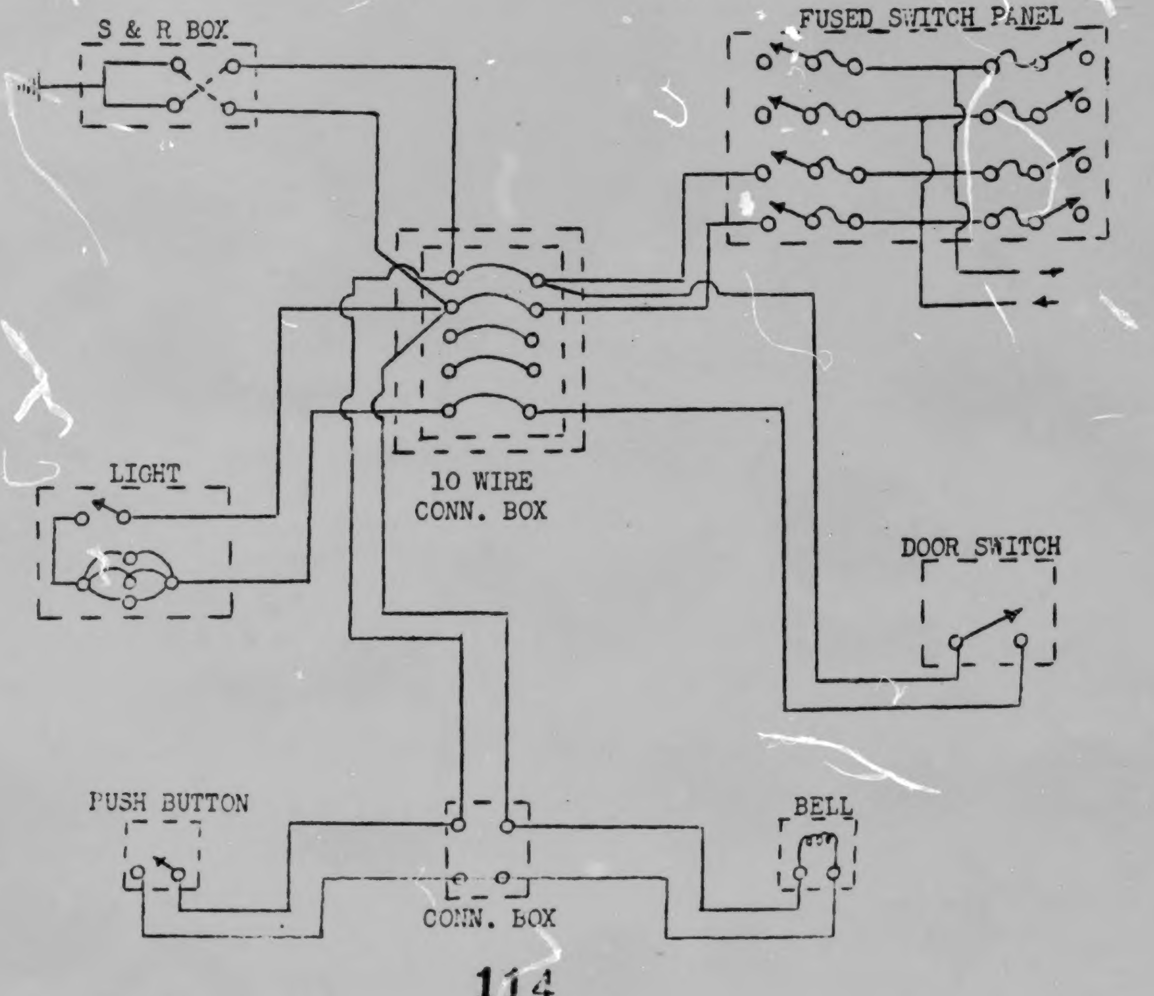

S & R BOX
FUSED SWITCH PANEL
10 WIRE CONN. BOX
LIGHT
DOOR SWITCH
PUSH BUTTON
BELL
CONN. BOX

EXHIBIT B

GROUND TESTING

Description

The examinees were required to take ground readings on eight different pieces of equipment commonly used by Electrician's Mates:

1. Dead Front Switch Panel. This switch panel has all of the "live" parts enclosed in heavy sheet metal with only the switch handles exposed. It is better known as the Main Switchboard aboard ship.
2. Compound D.C. Generator
3. Live Front Switch Panel. This switch panel serves the same purpose as the dead front switch panel, but differs in that the switches are exposed. It is used as an auxiliary switchboard aboard ship.
4. Shipboard Lighting Circuit Panel
5. Power Panel
6. Three Phase A.C. Motor
7. Controller. This was connected with the A.C. motor.
8. Fuse Panel

Grounds were placed in some of these equipments, and others were left in a normal condition. In order to obtain correct ground readings, the examinees had to perform the correct preliminary operations, for example, open or close switches, lift the brushes from the generator to isolate the field from the armature, remove fuses, etc. They also had to be able to use common hand tools and operate a megger.

Scoring

One point was given for each correct ground reading. The total possible score was 33.

Readings taken on the Dead Front Switchboard were not counted in the total possible score. This was a brief warm-up period, utilized as such becuase the resistances to ground in this equipment could not be controlled from one examinee to the next.

Reliability

Two estimates of the internal consistency reliability of this test were made. The first estimate was based on scores on odd and even units, for example, odd and even switches, counting both poles of a switch (positive and negative) as a single item. The corrected correlation between odd and even item scores using this method was .86 (N = 100).

The second estimate was based on odd and even responses within units. For example, the negative pole of switch number 1 and the positive pole of switch number 2 were counted as odd items. The other poles of these switches were counted as even items. Using this method, the corrected correlation between odd and even item scores was .94 (N - 100).

Evaluation

The Ground Test called for the examinees to work with a broad sample of electrical equipment found aboard ship. It demanded a knowledge of the interrelationships among these equipments and the skill to isolate them from one another for purposes of taking ground readings. Results of a test of this type should give a good indication of Electrician's Mates' familiarity with electrical equipment, and their ability to work with it.

An evaluation of the test results at the EM School clearly indicated that some of the trainees not only did not know where readings should be taken on the equipment, but that some of them actually did not know how to use a megger, a simple, but indispensable device to Electrician's Mates. This discovery "sold" some of the previously skeptical Chief Petty Officers on the

EXHIBIT B

value of performance tests.

The distribution of scores shows a range from 3 to 31 with good discrimination among the examinees.

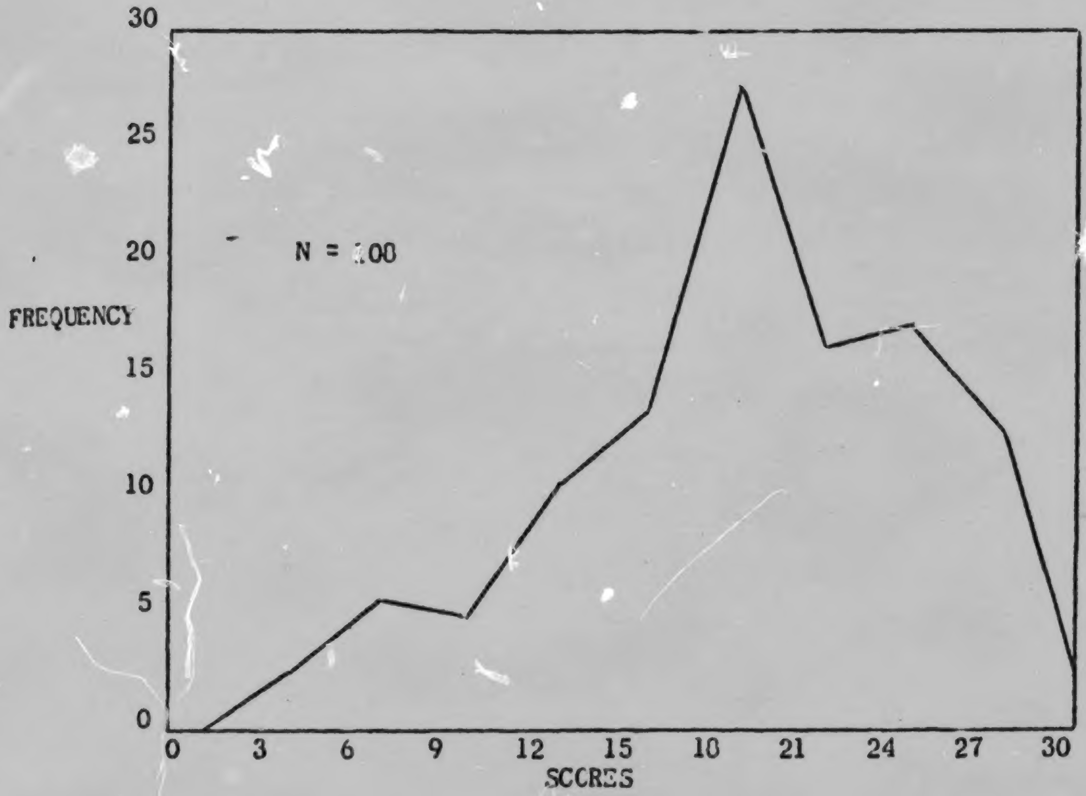
The correlation between raw scores and the time taken to perform the task was -.02, N = 105, again indicating no relationship between speed and adequacy of performance.

The correlation between Ground Testing scores and other test scores in the battery ranged from .06 to .26. The correlation with final class standings was .22 (N = 108). With final written achievement examination scores, the correlation was .21 (N = 108). Ground test scores correlated .11 and .08 (N = 97) with General Classification and Mechanical Aptitude test scores, respectively.

EXHIBIT B

TEST RESULTS

GROUND TESTING



RAW SCORE RESULTS	TIME
Mean - 19.4	Mean - 37.2 (Minutes)
Median - 19.5	S.D. - 13.3 (Minutes)
S.D. - 5.9	

RELIABILITY

Odd-Even Grouped* Responses: .86 (Corrected)

Odd-Even Single* Responses: .94 (Corrected)

EXHIBIT B

TEST MMRC 105 E1 RAW SCORE: ______

SEPTEMBER 1952 START: ______ FINISH: ______ TIME: ______

NAME: ______________________ RATE: ______ CLASS: ______

GROUND TESTING

Directions: TAKE GROUND READINGS ON THE EQUIPMENT LISTED BELOW. RECORD YOUR READINGS IN THE BLANK SPACES PROVIDED. NOTICE THE NEGATIVE TERMINAL IS ON THE LEFT ON BOTH THE EQUIPMENT AND THE ANSWER SHEET. ALSO, A IS ON THE LEFT ON BOTH THE EQUIPMENT AND THE ANSWER SHEET. DON'T WASTE TIME, EXTRA CREDIT WILL BE GIVEN FOR RAPID WORK, BUT OBSERVE ALL SAFETY PRECAUTIONS. ARE THERE ANY QUESTIONS?

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1. DEAD FRONT SWITCH BOARD

	Negative	Positive
Switch No. 1		
Switch No. 2		

	A	B	C
Switch No. 3			
Switch No. 4			

2. GENERATOR

Armature: ______

Field: ______

3. LIVE FRONT SWITCH BOARD

	Negative	Positive
Switch No. 1		
Switch No. 2		

4. LIGHTING PANEL

	Negative	Positive
Switch No. 1		
Switch No. 2		
Switch No. 3		
Switch No. 4		

5. POWER PANEL

	A	B	C
Switch No. 1			
Switch No. 2			
Switch No. 3			

6. A. C. MOTOR

______

______

7. CONTROLLER: PILOT CIRCUIT

______

8. FUSE BOX

Fuse A	Fuse B	Fuse C
Fuse A	Fuse B	Fuse C

KEEP YOUR ANSWER SHEET FACE DOWN
WHEN NOT WRITING

EXHIBIT C

USE OF COMMON HAND TOOLS

Description

This test was not, strictly speaking, a practical performance test, but probably resembled a performance test more than a written test. The examinee sat before a tool board containing 86 different tools, each of which was numbered. He was required to indicate the tool or tools he would use to do a task which was described on the test answer form. Twenty-two different tasks were described, and the subject responded by writing the number of selected tool(s) on his answer sheet.

The time limit on the test was twenty minutes, which was sufficient for all examinees to finish.

Scoring

One point was given for each properly selected tool. The total possible score was 29.

Reliability

The corrected internal consistency reliability of the test as estimated from odd-even item scores was .71.

Evaluation

This test provided a measure of men's knowledge of the uses of various hand tools. While it cannot be stated that the test scores gave an indication of how men actually use the tools in performing practical tasks, it is assumed that knowledge of which tool to use is necessary before the tools can be employed properly.

A test task might be devised which required examinees to demonstrate the proper use of a wide variety of tools. Such a test probably would be highly

EXHIBIT C

time consuming, however, and require an examiner for each examinee.

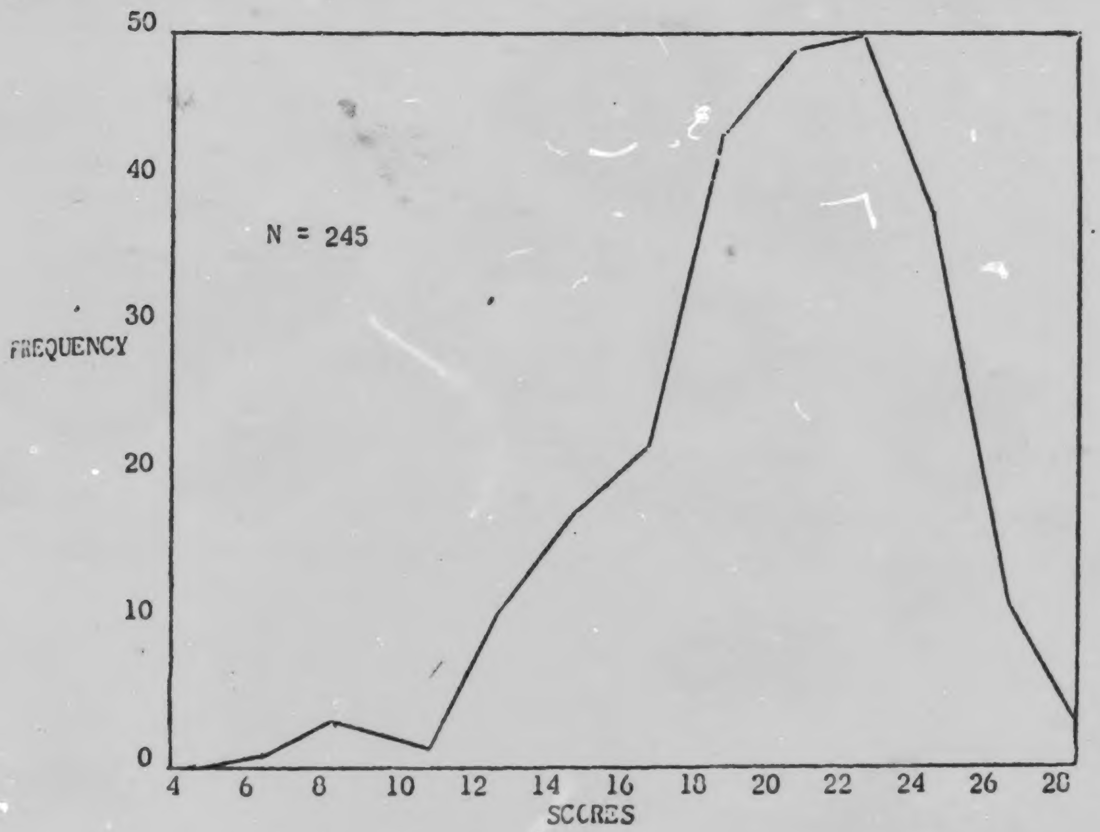
The distribution of scores approached normality with a mean score of 20.2 and a median score of 20.6. The test discriminated well among the examinees.

Tool test scores correlated with other performance test scores from .04 to .27. Correlations with the final written achievement examination and final class standings were .20 and .36, respectively, (N = 245). The latter correlation is slightly spurious, since tool test scores in part determined the final class standings. The correlations with GCT and MAT scores were .03 and .28, respectively, (N = 228).

EXHIBIT C

TEST RESULTS

USE OF COMMON HAND TOOLS



RAW SCORE RESULTS

Mean = 20.2

Median = 20.6

S.D. = 3.9

RELIABILITY

Odd-Even Items: .71 (Corrected)

EXHIBIT C

TEST MMRC - 105 A1 SEPTEMBER 1952

I. SCORE:_____ USE SCORE: -- TOTAL SCORE:_____ GRADE:_______

NAME:______________________________ RATE:_____ CLASS:_______

USE OF COMMON HAND TOOLS

Directions: IN THE BLANK APPEARING AFTER EACH OF THE JOB QUESTIONS BELOW, PLACE THE NUMBER OF THE TOOL OR TOOLS YOU WOULD USE IN DOING THE JOB. IF THE JOB CALLS FOR MORE THAN ONE TOOL, LIST THE NUMBERS OF EVERY TOOL YOU WOULD USE IN THAT JOB. HOWEVER, POINTS WILL BE DEDUCTED FOR LISTING UNNECESSARY TOOLS. HERE IS A SAMPLE TEST QUESTION:

A. What tool or tools would you use to remove a round metal pin from an armature shaft? 23, 67

NAMES? Pin or drift punch, ball-peen hammer

ADDITIONAL CREDIT WILL BE GIVEN FOR WRITING THE NAMES OF THE TOOLS YOU WOULD USE IN THE SPACE PROVIDED BELOW EACH QUESTION. WHETHER OR NOT YOU CAN NAME THE TOOLS, MAKE SURE YOU PUT THE NUMBERS OF ALL THE NECESSARY TOOLS FOR EACH JOB IN THE BLANK SPACE OPPOSITE THE JOB QUESTION.

ARE THERE ANY QUESTIONS?

Time Limit: TWENTY MINUTES

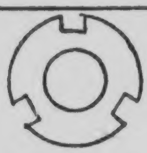
---

1. What tool or tools would you use to compare the diameters of two wires? ________

NAMES?______________________________

2. What tool or tools would you use to loosen the nut shown below? ________

NAMES?______________________________



3. What tool or tools would you use to cut off a section of 1/4" copper tubing? ________

NAMES?______________________________

4. If you did not have a stop watch, what tool or tools would you use to determine the speed of a rotating shaft? ________

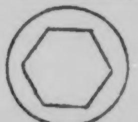
NAMES?______________________________

EXHIBIT C

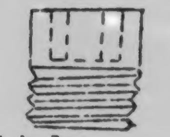
5. Here are two views of a set screw. Which tool or tools would you use to tighten this screw? ____________

NAMES? ____

Top View



Side View



6. What tool or tools would you use to make round holes in a gasket? ____________

NAMES? ____

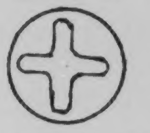
7. Which tool or tools would you use to measure the number of threads per inch on a 1/4" diameter bolt? ____________

NAMES? ____

8. Which tool or tools would you use to loosen the machine screw pictured below? ____________

NAMES? ____

Top View



9. Which tool or tools would you use to measure the depth of a 3/8" diameter hole? ____________

NAMES? ____

10. Which tool or tools would you select to measure the diameter of a rod (approximately 1/4" in diameter) to the nearest one-thousandth of an inch? ____________

NAMES? ____

11. What tool or tools would you use to measure the distance between controller contact points? ____________

NAMES? ____

12. What tool or tools would you use to keep a shaft from turning while the end nut was being tightened? ____________

NAMES? ____

EXHIBIT C

13. What tool or tools would you select to count the number of turns a shaft makes? ________

NAMES? ________________________________

14. What tool or tools would you use to cut and dress a piece of 3/32" (thick) sheet copper? ________

NAMES? ________________________________

15. What tool or tools would you use to cut off the head of a bolt rusted to a steel plate? ________

NAMES? ________________________________

16. List all the tools you would use to tap full threads to the bottom of a blind hole? ________

NAMES? ________________________________

17. In addition to a straight edge, what tool or tools would you use to draw lay-out lines on a piece of sheet copper? ________

NAMES? ________________________________

18. What tool or tools would you use to remove the nuts holding the lugs in a 20 wire connection box? ________

NAMES? ________________________________

19. What tool or tools would you use for making a 1/4" round loop in the end of a piece of wire? ________

NAMES? ________________________________

20. What tool or tools would you use to loosen a 3/4" nut on a battery? ________

NAMES? ________________________________

21. List all the tools you would use to make a 1/4" hole in a 1/2" thick steel plate? ________

NAMES? ________________________________

22. What tool or tools would you use to make a 1/4 - 20 stud from 1/4" round stock? ________

NAMES? ________________________________

EXHIBIT D

TRANSMITTER TUNING

Description

This was a procedural check list type of performance test. The examinee was required to tune the TDE transmitter, which was selected because of its wide use and because it embodies all the basic points of transmitter tuning. As the examinee performed the tuning task, an examiner observed and recorded whether or not he performed each step correctly.

Scoring

Scoring this test presented some interesting problems. Since performance on each successive step in the test task was to some extent dependent on performance at prior steps, an examinee might make a whole series of incorrect adjustments simply because he was "off" on some early step in the procedure. Furthermore, his subsequent adjustments might have been perfectly appropriate, assuming, as the examinee would, that the early step was correct.

The problem, then, was to score the examinee's performance in some fashion which would properly reflect the number of steps done correctly and avoid this correlation of errors. The solution was to prompt the examinee each time he made an error or was "off". Thus each examinee either did a given step correctly by himself or was prompted so that in any case the step was properly completed. This assured that each examinee performed a given step with the equipment in the same condition, thus helping to standardize the task.

The examinees score was the number of steps completed without prompting. The total possible score was 42.

EXHIBIT D

Since experienced men consider that time taken reflects skill in the transmitter tuning task, time was also used as a score. The correlation (Spearman rank-difference, N = 40) between time taken and raw scores was found to be .20. Thus, at the trainee level, at least, there was little relationship between how well a man tuned the transmitter and how long he took to do it.

Some of the items on the test required rather complex responses while others required only the turning of a switch to one of two alternative positions. For this reason, a system of weighted scores was tried. Differential weights were obtained by averaging the judgment of several experienced men. The rank order correlation between weighted and unweighted scores was found to be .95, (N = 71). Scores based on weighted items produced practically the same rank order of examinees, but did serve to increase the dispersion of scores.

Reliability

The test was administered twice to 40 men with a time interval of two weeks between administrations. The test-retest reliability computed from these data was found to be .89, (unweighted scores).

It is of some interest to note that, in retesting the forty men, the assignments of equipment, examiners and frequencies were different from those made during the first administration of the test. This indicates that reliability of the test was not a function of particular examiners or of practice on a particular transmitter at a particular frequency.

EXHIBIT D

Evaluation

The test discriminated among striker RM's on the basis of both time and raw scores. The raw scores ranged from 17 to 42 with a mean score of 34.1 and a median score of 34.6. The time scores ranged from 4 to 10 minutes with a mean of 10.4 and a median of 10.1 minutes.

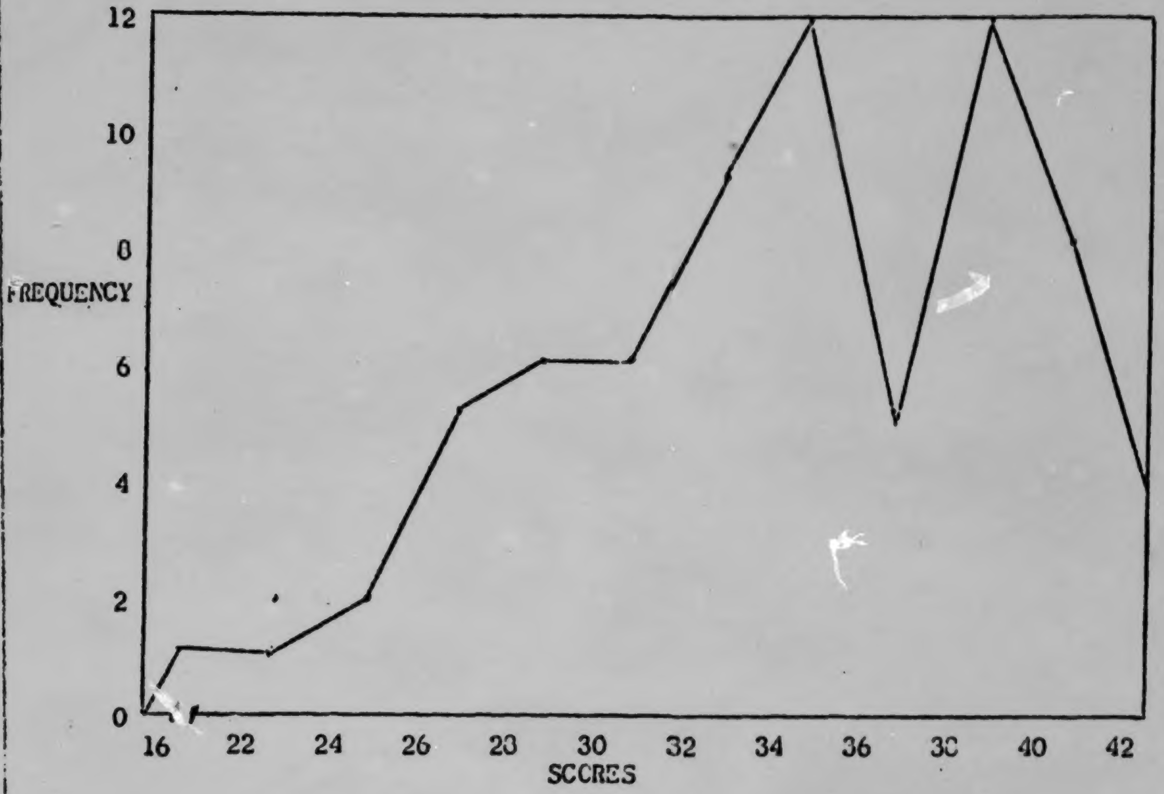
Transmitter tuning scores and other RM performance test scores correlated from .08 to .39. The highest correlation was with Circuit Drill scores.

While the test required one examiner for each examinee, its discrimination ability and reliability warrant its use as a performance measuring device. In addition the test should prove to be an excellent training procedure both afloat and ashore.

EXHIBIT D

TEST RESULTS

TRANSMITTER TUNING



RAW SCORE RESULTS

Mean = 34.1

Median = 34.6

S.D. = 5.4

TIME

Mean = 10.4

S.D. = 3.2

RELIABILITY

Test-Retest: 89

EXHIBIT D

TEST HMRC 105 - TTCb

DECEMBER 1952

EXAMINER: ______________________________

INSTRUCTION SHEET
TRANSMITTER TUNING TDE (HF)

Instructions for examiner:

1. Use frequency above 3.0 mcs. The same frequency is to be used for all examinees.

2. Have the frequency meter already set to the desired frequency.

3. Set all transmitter controls to positions that will require re-setting by the subject being examined.

4. Examinees are to be tested one at a time. Do not allow any examinee to watch another being tested.

5. Directions for scoring each examinee:

   NOTE: For each person being examined there will be two scores obtained by the examiner:

   a) Time. The examiner is to time each person for Parts I through V with a stop watch and enter this time in the blank provided in the right hand corner of each record sheet.

   b) The number of prompts. The examiner is to observe the tuning of the transmitter closely and prompt the examinee, if necessary, on each of the steps of the tuning procedure. Scoring of each step will be as follows:

      If it is necessary to prompt the subject because he makes a mistake in the procedure (wrong dial setting, wrong meter reading, etc.) or he forgets the step, incircle the zero (0) before each item:

      1 ⓪

      If the subject is able to perform each step correctly with no errors and requires no prompting, encircle the number one (1) before each item:

      ① 0

6. Read the following instructions to the examinee:

   "You are to be tested one at a time. You will not be allowed to watch any other person being tested. You are to tune this transmitter all the way through for operation on this frequency: ________________ KCS. This probably will involve the use of all controls A through K. The frequency meter is already set up for you."

   "You will be observed and prompted if necessary on each step. Work as rapidly as possible. Are there any questions?"

7. Tell the examinee to begin and start the stop watch.

EXHIBIT D

TEST M[illegible]C 105 - TTCa

DECEMBER 1952

TIME: ________

DATE: ____________ SCORE: ________

NAME: ____ RATE: ____________ CLASS: ________

EXAMINER: ________________________________

RECORD SHEET
TRANSMITTER TUNING TDE (HF)
DESIRED FREQUENCY __________ KCS

START

PART I PRELIMINARY SETTINGS

1 1. Set the following controls and switches in the indicated positions:

		CONTROL	POSITION
1	0	HF-IF switch, control A	HF
1	0	Remote-Local switch	Local
1	0	Adjust-Tune-Operate	Adjust
1	0	CW-MCW-Voice switch	CW
1	0	Antenna coupling control K	15-20
1	0	Antenna tuning capacitor control M	50

2. Set the following controls to the position of the approximate frequency to be set up:

CONTROL

1 0 B
1 0 C
1 0 D
1 0 E
1 0 F
1 0 G
1 0 H
1 0 J
1 0 N

PART II MASTER OSCILLATOR TUNING

1 0 3. Press the start button and adjust filament voltage 10 volts.

1 0 4. Adjust plate voltage to 2000 volts.

1 0 5. Press test key on handrail and tune master oscillator, control C for zero beat in headphones.

PART III RESONATING ALL STAGES
(Test key must be pressed to tune all following stages)

1 0 6. Shift Adjust-Tune-Operate switch to tune position.

1 0 7. Adjust control E for maximum I.A. grid current.

1 0 8. Adjust I.A. tuning control G for maximum P.A. grid current.

1 0 9. Adjust P.A. tuning control J for minimum P.A. plate current.

1 0 10. Adjust antenna inductance for maximum P.A. plate current. (If no peak is obtained, does he shift ant. feed sw. to other position?)

1 0 11. Adjust antenna capacitance for maximum P.A. plate current.

1 0 12. Re-adjust P.A. tuning control J for minimum P.A. plate current.

PART IV ANTENNA COUPLING: TUNE

1 0 13. Increase antenna coupling for 70 ma. of P.A. plate current.

1 0 14. Re-adjust P.A. tuning control J for minimum P.A. plate current.

1 0 15. Re-adjust antenna inductance for maximum P.A. plate current.

1 0 16. Re-adjust antenna capacitance for maximum P.A. plate current.

PART V ANTENNA COUPLING: OPERATE

1 0 17. Shift Adjust-Tune-Operate switch to operate position.

1 0 18. Re-adjust P.A. tuning control J for minimum P.A. plate current.

1 0 19. Re-adjust antenna inductance for maximum P.A. plate current.

1 0 20. Re-adjust antenna capacitance for maximum P.A. plate current.

1 0 21. Is P.A. plate tuning at a minimum with plate current at approximately 100 ma?

STOP

PART VI FINAL CHECK BY EXAMINER

Directions: The examiner is to check the transmitter itself and answer each of the following items. Encircle yes or no.

YES NO 1. Are filament and plate voltages correct?

YES NO 2. Are any of the current meter readings too high?

YES NO 3. Is each stage tuned to the correct frequency?

YES NO 4. Are grid current meters peaked exactly?

YES NO 5. Is P.A. plate current at exact dip?

YES NO 6. Are antenna inductance and capacitance peaked?

YES NO 7. Is it overcoupled?

YES NO 8. Did he depress the test button only while tuning?

State of the Art - TDCA

The state of the evaluation art for TDCA training makes eliciting lifelike behavior with a performance test an expecially desirable method for measuring job performance. The scope of TDCA's training ranges from maintenance training to training in the principles of supervision. Such diversity must be met with a diversity of measurement methods and, more specifically, with a diversity of performance tests. While the cost of performance tests are relatively high when compared to less effective evaluation methods, the cost should not be seen as solely a cost of evaluation. Performance tests, when properly constructed, can be used as highly effective training devices and as end-of-training evaluation instruments. The use of the same instrument for three purposes will not only spread its cost but will also provide a degree of consistency between three components of DOES.

COMMUNITY IMPACT OBSERVATION

A General Description of the Problem

The decade of the sixties, largely influenced by President Johnson's Great Society program, witnessed enormous outpouring of federal government resources toward the alleviation of social and educational problems. Many of the programs initiated during this era were conceived and operationalized literally overnight and funded liberally. One of the assumptions made was that government and the professions at all levels were capable of implementing programs addressed to priority needs that would produce favorable results in a short period of time. Following upon the heels of this movement, was an increased concern for evaluation and accountability with respect to the social and educational programs. Government officials at all levels began to inquire about the impact of various programs upon target populations. At this time then from a national perspective great emphasis was placed upon evaluation of program.

The Texas Department of Community Affairs, a state agency heavily involved in community improvement programs, also began to inquire about the effectiveness of its programs upon clientele in Texas. In particular, the executive director expressed a desire to know if funds under Title VIII of the Housing and Urban Development Authority, dealing directly with training of local government officials, were producing any effects. In this regard the question was phrased as follows: "Are our training programs having any impact on local community development?" Impact was defined by TDCA as the ability of local government to respond to local needs. Thus we have the general origin of the need for evaluation that resulted in the development of DOES.

This report will center on various aspects of community impact evaluation, and present a brief treatment of the historical background regarding movements that affect development of "community impact" evaluation. Then the specific conceptual and methodological problems will be discussed; recommendations will be presented to the Texas Department of Community Affairs with respect to this type of evaluation.

Historical Background

In dealing with community impact evaluation one is attempting to assess the quality of life in a community either directly or indirectly. Attempts to deal with this issue can be traced back to the presiential administration of Herbert Hoover (Wilcox, 1972). In 1929 a commission created by Hoover was to conduct a survey of social trends within the United States. The commission's report pointed out the complexity of social trend analysis in attempting to understand social phenomena. The commission recommended the convening of interdisciplinary panels for the purposes of developing what are now called social indicators. The onset of the depression of the thirties clearly sidetracked this work. The emphasis shifted to the development of economic indicators to monitor the recovery of the economy of the United States.

Due to World War II and other pressing national concerns, interest in social indicators appeared to wane. During the fifties and the sixties the National Aeronautics and Space Administration became concerned with the possible long range consequences of space exploration with respect to ways in which it may impact upon the social life in the United States. Out of this concern a commission was convened to explore the social ramifications of the NASA program. This effort produced the oft-cited book, Social Indicators by Raymond Bauer (Bauer, 1966). From this time on there has been a growing interest in monitoring social conditions within the United States and a considerable body of literature is beginning to emerge dealing with this problem.

Another significant event occurred in 1966 when President Johnson commissioned the Department of Health, Education and Welfare to develop sets of statistics and indicators of general societal development that would be analogous to the broadly used economic indicators. In 1969, the commission's publication Toward a Social Report was circulated. This report attempted to deal with the complexity of issues, the definition of concepts and proposed methodologies to deal with social accounting.

Since 1969 there have been many attempts to isolate and clarify issues and to define further key concepts within the field of social indicators. However, the field is still beset with many theoretical and conceptual problems in addition to research and evaluation methodological problems. In short, while progress has been made, the general field is far from having the conceptual and the operational rools to perform an adequate job of monitoring and evaluating improvements in the quality of life as a function of social programs.

Emerging Evaluation Methodology

Another important movement during the sixties was taking place within the field of education. This movement toward a reconceptualization of the purposes and the methodologies for evaluating the outcomes of educational programs is of great significance to DOES. Prior to the mid-sixties, educational evaluation had been concerned primarily with outcome evaluation, that is making judgements about the effectiveness of programs based on learner performance at the end of a given learning sequence. To a large extent this orientation toward evaluation was influenced by the standardized educational testing movement. In turn testing movement was influenced from the 1920's through the mid-1940's by the needs of the armed forces. This movement toward standardized testing was largely influenced by the emerging discipline of psychometrics. Psychometric theory, the concern for norm-reference testing and methodological issues related to reliability and validity captured the essence of the evaluation movement until the mid-sixties.

Lee Cronbach (1964) gave impetus to the reconceptualization of the purposes of evaluation. He questioned[1] the purpose of evaluation centered on end-of-course achievement and proposed that evaluation directed toward the improvement of courses while they were being developed would be of far greater service to education. This general call to a reconceptualization of evaluation stimulated by Cronbach led to a reformulation of the purposes of evaluation and to an examination of the methodologies and the premises upon which evaluation was conducted.

During this period of time the Phi Delta Kappa fraternity commissioned a group to formulate a new approach to educational evaluation. This group headed by Daniel Stufflebeam and Egon Guba formulated a decision orientation to evaluation. The publication of their book Educational and Evaluation Decision Making (Stufflebeam, 1971), has made a significant input to the field and strongly influenced the development of DOES. Another important event during this period resulted in the attempt to bring to educational evaluation perspectives from many other social science disciplines. Thus during the latter half of the sixties, a great effort in education was made to synthesize methodologies from diverse fields in an attempt to look at evaluation methodologies from multiple perspectives. This entire evaluation movement of the sixties has significantly influenced the development of the DOES system.

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[1] Cronbach, L. J. Course improvement through evaluation. Teachers College Record, 1963, 64

Summary

The preceding provides an overview of the forces which have led to the current concern for evaluation of impact of social programs and those forces that have shaped this project. The evaluation problem for DOES is somewhat limited in that we will attempt to trace "community impact" as a function of training intervention. That is, we will be concerned only with changes in a community insofar as those changes can be related directly or indirectly to training conducted by the Texas Department of Community Affairs.

Community Impact Training Evaluation

Perspective

It is important to note that community impact evaluation as used in the model finds its origin in training evaluation and attempts to trace the effects of training through job performance to its effect upon the community. That is, "impact evaluation" will be concerned only with the extent to which training intervention and the resultant improvement of job performance could be traced to some indicator within community life related to training and subsequent job performance. For example, if on the basis of a documented need receptionists in the offices of city departments were to be trained to handle citizen telephone complaints more courteously, then the subsequent job performance of the receptionists could be monitored and a direct or indirect measure of the effect of their behavior upon citizens could be ascertained. Impact evaluation could be conducted by means of survey methods such as post cards sent to citizens who called in complaints requesting an evaluation of the manner in which their complaint was handled. Another method might involve inspecting records to determine the trend in numbers of complaints received about courtesy of receptionists' responses to the public over time. It is important to underscore once again that for the purposes of DOES the community indicator must bear some direct relationship to training.

Selection of Indicators

Probably the most important problem facing the Texas Department of Community Affairs with respect to community impact training evaluation will be the identification of community indicators that would serve as criteria for evaluation. The scope of the training offered by TDCA is so generally broad, that it may be difficult to trace objectives of training to a set list of community impact indicators. In all probability, the indicators would have to be idiosyncratic to the problem. In all likelihood the best and most reliable data to evaluate community impact as a function of training would be those public data that are independently gathered as municipal records. For example, if a municipality keeps records on requests for service, or complaints from the public and if all municipal departments keep records indicating the tasks performed by workers within departments, these records provide prime data for evaluation related to training and community impact.

When using material process records to evaluate the effect of training intervention, one would look at the direction of changes in indicators, as a function of job training, as opposed to looking for the magnitude of the change. There are so many confounding variables operating in a municipal work situation that attempts to isolate the magnitude of change as a function of training intervention will be futile.

It is critically important that indicators selected for outcome evaluation have credibility in the eyes of decision makers. If indicators are selected to satisfy primarily the needs of social scientists they may be perceived non-relevant by governmental decision makers; unless evaluation data are perceived as useful, an entire evaluation effort will fail--given the context of DOES.

Citizen Complaints as Social Indicators

One effective means for tracing the effects of community development training would be to look at citizen complaints. The work of Ezra Krendel (1970) provides a system for processing of citizen complaints as an indirect measure of the quality of life within a community. The model developed by Krendel looks at response time as a major criterion in achieving satisfaction on the part of the citizens of the community. That is, the extent to which complaints can be responded to effectively is a measure of the quality of life in that community. Krendel's work was modeled on information gathered by the Mayor's Office of Information and Complaints in Philadelphia. A similar model for gathering and processing citizen complaints will be presented in an Appendix; the system described will be one developed by Mayor Orville Hubbard of Dearborn, Michigan. Hubbard's system has proved to be an effective means of delivering quality service to the citizens of Dearborn.

Methodological Problems of Community Impact Evaluation

One of the major problems associated with gathering data relative to impact on a community may be one of intrusiveness. That is, if an evaluator were to use questionnaires, surveys or some other type of data gathering where "outsiders" come into a community and conduct interviews to gather data, the results are likely to be invalid. Many studies have demonstrated that the tendency will be for the respondents to tell the interviewer what he thinks the interviewer wants to hear, not what the responder really believes. This distortion of information is particularly true when the subjects of interviews are members of minority groups, ethnic groups or the poor. Another problem associated with interview techniques are biases imposed upon data collection and analysis by the investigator. Consequently, relying on these sources of data gathering of "community impact" creates a multitude of problems.

Perhaps an effective means of gathering relevant information would be to collect data unobtrusively through observation of natural phenomena within a community in such a way that one does not intrude or disturb the environment. Methodologies employed by cultural anthropologists, sociologists, and recently by educational researchers, where one becomes part of the environment while observing it, offer some interesting data collection modes (Webb, 1967). As mentioned earlier the most valuable data for evaluation of impact of public and social programs would be to process data normally collected by governmental agencies. Records of various types of services performed, expenditure rates for material, police records and the like provide a rich source and perhaps the best source of information. If carefully collected, documented and selectively used, these data can provide perhaps the most reliable data for evaluating community impact as a function of training.

Wherever possible naturalistic or process data collected by agencies could be scanned through a variety of techniques to detect trends over time. One could use a number of quasi-experimental designs such as the interrupted time series designs proposed by Campbell (1970) to gauge whether changes in trends had occurred in these data. Further, if one can identify specific times at which training has occurred and then develop a sampling procedure to gather data at specified time intervals, this probably can provide the most valid and reliable way of gathering impact.

Process Records as Indicators

The objective of using process record data is to develop and establish criterion variables by means of which the effects of implementation of program objective can be verified.

There are two major methodological problems in using data from process records in evaluating attainment of program objectives. These problems are the relevance and sensitivity of the data to program effects. Relevance refers to the logical plausibility connecting the implementation of, program objectives to the effects produced in the data. For example, it would be plausible to expect that doubling the number of police patrols in a high crime area would eventually reduced the number impact crimes and citizen complaints about these crimes in that area. Both the frequency of and citizen complaints about impact crimes would be relevant measures of that program effect. However, one would not expect the same program strategy or the same data to be as relevant for other types of crimes, say, embezzlement.

Record keeping systems in fact may be in existence. Whether they record data relevant to specific program objectives will be a question subjuct to logical analysis of plausibilities and to empirical verification. A process variable may pass the test of relevance but may furnish data that are simply not sensitive to the effect to be measured. The lack of sensitivity of such data may be due to statistical unreliability (noisiness) or to inadequacies in sampling the process. To be of any use, process record data must be sensitive to changes brought about by implementation of program objective. That is, there must be a reliable association between the process variable(s) and the treatment effects produced by the program. In addition, the sampling process governing the collection of data must be fine-grained enough to resolve differences within appropriate time units. For example, a training program may have shortened a particular service delivery time from days to hours. Collection of data to the nearest day on such service delivery times would not reveal the difference in reduced delivery times.

The goal of using process record data is the detection of assignable (plausible) causes that are associated with the program implementation and the measurement of their effects on the community. There are inferential and analytic problems to be addressed in using process record data. On the inferential side these problems include a priori construction of a system of plausible hypotheses and ruling out possible spurious cause and effect associations. The development of a "battery" of impact indicators should follow a sequential sampling model in which each variable is empirically investigated on the basis of its sensitivity and relevance in contributing to the valid measurement of program effects. The sequential sampling model should also allow for continual modification of the system of hypotheses in order to achieve control over spurious and confounding variables.

On the analytic side, sampling plans should be developed to solve problems in the resolution of system response times already mentioned. The sampling plan should also take into account the appropriate trend evaluation model to maximize detection of impact effects (Campbell & Stanley, 1966). Finally, there is the analytic problem of the appropriate statistical tests to use in analyzing and drawing conclusions from process record data. The solution to the problem resides in the use of the appropriate data model for performing statistical tests. For example, when process records furnish data on response times the form of distribution (data model) for these data rules out statistical procedures based on the normal distribution. The solution would be to use some form of likelihood ratio analysis, based on the actual response time distribution, rather than statistics based on a normal distribution (Krendel, 1970; Dossett, 1965).

PART III

Training Package Evaluation

Guidelines for Training Materials Development and Subcontracting

Guidelines for Subcontracting Evaluation Studies

RECOMMENDATIONS TO TDCA REGARDING COMMUNITY DEVELOPMENT TRAINING IMPACT EVALUATION

Surveys

Our first recommendation to TDCA regarding community impact training evaluation resides within the input evaluation mode. We strongly recommend that the agency conduct a survey of municipalities and county governments to identify the kinds and types of records that are currently being kept by these agencies. The subsequent development of a taxonomy or catalog of naturalistic records kept by these agencies could then be developed so that TDCA would be in a position to know what data would be available to conduct impact evaluation studies. Following this survey and a study of the type of records kept, it may be possible for the agency to begin to standardize some of the data collection mechanisms used by different municipalities such that comparable records would be available.

The second recommendation follows closely upon the first. We recommend that TDCA closely examine the type of system developed by Mayor Hubbard of Dearborn, Michigan (see Appendix I). This system if installed in Texas communities would not only directly improve service but the data gathered could be used to assess the effects of community development activity over time. Naturalistic data collected by local government services will provide a good foundation for the conduct of impact studies in the future; it would be time and money well spent.

Training Package Evaluation

Criteria for Evaluation Training Packages

From a research perspective, the state of the art in training materials development must be termed primitive. This statement should not be interpreted to mean that there are not highly refined procedures for the development of training materials nor is there a lack of evaluation of training. The point to be made, simply, is that there are few empirically derived generalizations that one can make about the effectiveness of instructional media across training areas and across different training populations. The reason for this lack of generalizable information for instructional or training materials development is largely due to methodological problems in training and instructional research. In summarizing past research, Baker[1] points out that there is little evidence to support the notion that a given media as a media provides for more effective learning. Briggs[2] does point out, however, that multi-media instruction has proved superior to single media instruction. During the past ten years, with the emergence of educational research and development related to instructional product development, there have emerged a number of principles to guide the development of instructional materials;[1] however, most evaluative studies are specific to a particular training program or to a particular instructional product.

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[1] Baker, Eva L., The technology of instructional development in Travers, R. M. W., Second Handbook of Research on Teaching, Chicago: Rand McNally, 1973.

[2] Briggs, L. J. et al, Instructional media, Monograph No. 2, Pittsburgh: American Institutes for Research, 1967.

The enormous research effort that the military has undertaken to evaluate the effectiveness of their training programs is indeed commendable. However, there still is insufficient data regarding the critical variables that affect instructional media as they interact with learner variables; no generalizable statements, emerging from research, regarding effectiveness of specific training materials across training areas can be made at this point in time. Indeed, it may not be possible for many years to come to make such statements. However, much can be gained from the practical experience and evaluation of specific courses provided by the military.

In the absence of generalizable empirically based guidelines to support training material development then the alternative is to examine closely high quality training materials that have undergone extensive evaluation and do indeed produce the desired results in learners. Examination of these materials will provide a basis for developing guidelines and criteria that could be used to evaluate the quality of training materials. This is the route which the CATE project chose to follow. We have based our work heavily upon military training development and evaluation, and upon educational instructional materials development and evaluation. In that regard, the criteria for evaluation of training packages does represent a vast body of literature, and the combined experience of the members of the CATE project staff who have engaged in instructional research and development.

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[1] Popham, W. J. in Baker and Schutz, 1971

Before presenting the criteria for the analysis of training materials, it may be helpful to view the following chart which represents a state of the art approach to the assignment of different types of instructional media to particular types of learning objectives. This chart reflects very well the experience and the evaluation results derived from military training, and the chart is consistent with the existing evaluation and limited research on educational treatment delivery. The chart presents a matrix of instructional media by learning objectives and the entries in each cell of the of the chart provide ratings of estimated effectiveness or suitability of media to particular objectives.

Table 8

Instructional Media Stimulus Relationships to Learning Objectives[1]

	LEARNING OBJECTIVES:					
TYPE OF INSTRUCTIONAL MEDIA	Learning Factual Information	Learning Visual Identifications	Learning Principles, Concepts, and Rules	Learning Procedures	Performing Skilled Perceptual-Motor Acts	Developing Desirable Attitudes, Opinions,& Motivations
Still Pictures	Medium	HIGH	Medium	Medium	low	low
Motion Pictures	Medium	HIGH	HIGH	HIGH	Medium	Medium
Television	Medium	Medium	HIGH	Medium	low	Medium
Training Aids	low	HIGH	Medium	Medium	low	low
Audio Recordings	Medium	low	low	Medium	low	Medium
Trainer (Simulator)	Medium	HIGH	HIGH	HIGH	HIGH	Medium
Programmed Instruction	Medium	Medium	Medium	HIGH	low	Medium
Demonstration	low	Medium	low	HIGH	Medium	Medium
Printed Textbooks	Medium	low	Medium	Medium	low	Medium
Oral Presentation	Medium	low	Medium	Medium	low	Medium

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[1] Adapted from Allen, William H., Research in Instructional Media and Art Education, Final Report of Uses of Newer Media in Art Education, Washington, D. C.: National Art Education Association, August 1966, in Air Force Manual 50-2, Instructional System Development, Washington, D. C.: Department of the Air Force, 31 December 1970.

Given this description of the state of the art of training and instructional materials development, the following criteria should prove useful in analyzing quality training materials.

Criteria for the Analysis of Training Packages

Program Goals, Learning Experiences and Evaluation.

1. Is there an explicitly stated general goal for the training package in terms of learner behavioral outcomes?
2. Are there specific learner behavioral objectives for each sub-unit of the training package?
3. Is there a clear correspondence between the general goals of and the unit objectives?
4. Do the learning experiences appear to be consistent with the unit objectives?
5. Are there provisions to inform learners of the objectives which they are expected to acquire?
6. Are the learners provided with an opportunity to practice the unit objectives they are expected to acquire?
7. Are provisions made for feedback to learners regarding their progress during the training?
8. Are provisions made for feedback to learners regarding their achievement at the end of training?
9. Are self-evaluation devices built in for learners to evaluate their progress en route?
10. Are performance evaluation measures available to determine learner achievement?

11. Are performance evaluation measures congruent with unit objectives?

Characteristics of Instructional Materials and Activities.

1. Are the roles for instructors clearly specified?
2. Are the roles for learners clearly specified?
3. Is training provided for instructors?
4. Are the training materials diversified with respect to media and instructional methods?
5. Are the training activities diversified for learners?
6. Are materials likely to be perceived as corresponding to the developmental or maturity level of the learners?
7. Are pretests provided for learners?
8. Can the trainees start at an advanced level?
9. Can they finish at different levels?

Characteristics of Evaluation Materials.

1. Are evaluation items and/or devices available?
2. Are evaluation items related to learner performance objectives?
3. Are learners given the opportunity to practice during training on items similar to criterion items?
4. Are problem solving techniques used to measure learner behavior?

B. Procedures for Evaluating Training Packages

Given the criteria for evaluating training packages in the previous section, the procedures for actual evaluation of training packages are a straight forward activity. The following steps will assist in the activity.

Step 1. Specify: training population--who is to be trained?
length of training in hours--how long?
general goals of training--what do you want from training?
type of training--what kind of experience do you want for trainees?
cost--how much can you pay? how much can trainee pay?

Step 2. Define what you mean by training:

Do you intend your training to:	Yes	No
1. present information	___	___
2. develop awareness	___	___
3. communicate theory/knowledge	___	___
4. promote identification and application of principles	___	___
5. develop an orientation	___	___
6. change attitudes	___	___
7. produce skilled behavior	___	___

Things you do to judge the quality of training packages you are examining:

Step 3. Examine and judge the goals and objectives of the training package in terms of:

	Acceptable	Unacceptable
1. correspondence with your objectives	___	___

	Acceptable	Unacceptable
2. course length	___	___
3. relevance to your needs	___	___
4. scope of objectives	___	___
5. behavioral quality of objectives	___	___
6. relevance to your pocketbook	___	___

Step 4. Examine and judge the experiences provided for trainees:

	Yes	No
Are they related to your objectives?	___	___
Do they require active participation of trainees?	___	___
Are experiences varied?	___	___

Step 5. Examine and judge built-in evaluation devices:

Are trainees made explicitly aware of outcomes?	___	___
Are trainees given opportunity to evaluate their own knowledge or skill acquisition?	___	___
Are trainees provided feedback on their experience?	___	___
Do trainees have opportunity to rate effectiveness of training?	___	___

Step 6. Examine and judge background information on training program:

Do developers have adequate qualifications?	___	___

	Yes	No
Is instructor's role clearly specified?	____	____
Is previous evaluation data presented?	____	____

Step 7. Summarize your judgments and decide:

Use program as is.

Seek modifications in the program to make it more congruent with your needs.

Judge it as inadequate for your needs.

Guidelines for Training Materials
Development and Subcontracting

Development of Training Materials--State of the Art

What can be said about the state of the art regarding the development of training materials has in effect been said in the preceding sections on the evaluation of training packages per se. The two are really inseparable. As noted from the previous discussion on training package evaluation, the development of training materials is still somewhat an "art form." However, it is highly recommended that officials in local, state or federal government in a position to subcontract the development of training materials contact two sources for information and materials. One source would be the Civil Service Commission of the federal government. Civil Service conducts a wide variety of training activities for government positions. The experience of the Civil Service with respect to training materials development and evaluation are well expressed in their two publications.[1] In addition to Civil Service materials, the CATE project strongly recommends the examination of instructional materials and training design systems used by the military. In this regard, Smith's book (1971) provides an excellent overview of the position on development of training systems gained through years of research and development with the U. S. Army. Another excellent publication is the Air Force manual 50-2 which deals with the problems and the processes involved in instructional systems development. These two sources provide the best and most comprehensive treatment of the topic. The CATE project highly recommends them.

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[1] See addendum to bibliography.

The guidelines which follow provide procedures to be used when subcontracting for the development of training materials. A government official in a position to subcontract development work should not do this without first examining the state of the art position papers with respect to training package evaluation and a careful examination of those criteria. To gain some idea of how RFP's are developed, it is recommended that the decision-maker review requests for proposal procedures developed by the military. The location of Air Training Command in San Antonio, Texas, provides the Texas Department of Community Affairs with a ready resource to be tapped for samples of RFP's and samples of high quality training programs.

The procedures to be followed in securing requests for proposals for training materials development are as follows:

Step 1. Identify potential clients.

A. Survey colleges and universities to identify departments, agencies, service bureaus, and individuals that have expertise in your area of interest.

B. Survey professional organizations related to the general field and identify a contact person.

C. Survey related governmental agencies (state and federal) for names of individuals who could provide you with potential bidders.

D. Survey Commerce Business Daily (U. S. Government Publication) for list of grant awards to private research and development firms doing business in your area of interest.

E. Collate and classify information gathered above for reference.

Step 2. Prepare a letter of interest.

A. Prepare a letter of interest for institutions listed above to ascertain their interest and availability to provide the services you are requesting.

B. In the letter of interest provide the potential client with:

1. Brief statement of purpose of the proposed project.
2. Scope and length of the proposed contract.
3. General requirements and constraints imposed on client (e.g. likely amount of the contract; conditions that must be met).

C. Ask client, if interested in project, to provide you with a brief prospectus of his organization including:

1. Actual work done related to contract area.
2. List of personnel and qualifications who are likely to be assigned to the project if contract is awarded.

Step 3. Screen Letters of interest.

A. Individuals and organizations who have little or no experience in your area of interest should be screened out at this point.

B. Some individuals and groups may not have proper qualifications for the work and should be screened out.

Note: The development of a response to an RFP is often a costly experience for both the client and the sponsoring agency; careful screening at this stage can save all parties considerable money.

C. Select those individuals and/or agencies who are most interested and best qualified to do your work.

Step 4. Prepare the RFP.*

A. Specify the training problem in one or two sentences.

B. Provide information on the education, age and work background of the training population.

C. State what you would like the trainee to be able to do at the end of training.

D. Specify the work task for the bidder.

1. Specify the product you expect from the bidder and its characteristics (e.g. the final product will be a set of training materials and accompanying leader's guide designed to train first line supervisors in municipal government to deal with the handling of minority group grievances. The training experiences shall include provisions for role playing, problem solving, and small group discussion.).
2. Specify the delivery date for the product and the quantity of the final product.

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*Be sure that you include a statement indicating that you reserve the right to reject any or all bids.

3. Specify the number field test conditions and data reporting (where applicable).

E. Specify the time schedule, budget format, and personnel qualifications.

  1. Require bidder to provide a time schedule and general plan for product development that include key check points for your monitoring purposes.
  2. Provide budget format you require of bidder.
  3. Require project staff summary with qualifications of key personnel.
  4. Specify date and time on which bids are to be received and opened.

How to Rate Contract Proposals[1]

RFP re: Date:

Name of Contractor: Total Rating Points:

Items: Contractor Qualifications

1. Professional qualifications ______
   Project manager
   Technical support personnel
2. Experience in training area ______
   Prior development work
   Related work

Proposal Qualifications

1. Clarity of training objectives ______
2. Congruence of objectives with training goals ______

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[1] Adapted from Otto, Clavin P. and Glaser, Rollin O., The Management of Training, Reading, Mass.: Addison-Wesley, 1970.

3. Congruence of training activities with your specifications ______
4. Diversification of training activities proposed ______
5. Acceptability of training activities to trainee population ______
6. Provisions for feedback to trainees ______

Budget and Time Schedule

1. Reasonableness of cost proposal ______
2. Acceptability of check points in the development process ______
3. Acceptability of other items ______

Total Rating ______

Rate each of the items as follows:

5 for quality that exceeds expectation
4 for highly acceptable quality
3 for acceptable quality
2 for marginally acceptable quality
1 for unacceptable quality

Note: The rating scale is provided as a means to assist in the screening of the overall quality of proposals. In the final analysis, one should screen very carefully several times, those few proposals that are of highest quality. Final decisions for selection of a contractor, when there are several competing bids, may be such variables of personal compatibility of project officers, distance from sponsoring agency and the like.

Guidelines for Subcontracting Evaluation Studies

Procedures for Developing RFP's for Three Modes of Evaluation

The rationale for proceeding in three modes of evaluation (CATE final report) and the DOES chart in the handbook provide the basis for developing RFP's for evaluation studies. The actual steps in subcontracting are as follows:

Step 1.

A. Review the types of evaluation by mode in the DOES evaluation system chart. (See Handbook.)

B. Examine input evaluation for each mode of evaluation.

1. Have these evaluation activities been conducted?
2. If not, decide whether you can perform these activities yourself or whether you should subcontract them.
3. If the evaluation activities have been completed, are you satisfied with the results? Can you work with them?

C. Make decisions about the types of evaluation studies you wish to have performed within each mode. (E.g., Job Performance Process Evaluation)

Step 2. Identify potential evaluation subcontractors.

A. Survey colleges and universities to identify departments, agencies, service bureaus, and individuals that have expertise in evaluation.

B. Survey professional organizations related to the general field and identify a contact person. (E.g., American Educational Research Association, American Management Association, American Institutes for Research)

C. Survey related governmental agencies (state and federal) for names of individuals who could provide you with potential bidders.

D. Survey Commerce Business Daily (U. S. Government Publication) for grant awards to private research and development firms who conduct evaluation studies.

E. Collate and catalog information gathered above for ready reference.

Step 3. Prepare a letter of interest to send out.

A. Prepare a letter of interest for institutions and individuals listed above to ascertain their interest and availability to provide the evaluation services you are requesting.

B. In the letter of interest provide the potential client with:

1. Brief statement of purpose of the evaluation study.
2. Scope, length of the proposed contract, and expected dollars available.
3. General requirements and constraints imposed on client (e.g. conditions that must be met).

C. Ask client, if interested in project, to provide you with a brief prospectus of his organization including:

1. Actual samples of evaluation work done related to contract area.
2. List of personnel and qualifications who are likely to be assigned to the project if contract is awarded.

Step 4. Screen letters of interest.

A. Individuals and organizations who have little or no experience in your area of interest should be screened out at this point.

B. Some individuals and groups may not have proper qualifications for the work and should be screened out.

Note: The development of a quality proposal response to an RFP is often a costly experience for both the client and sponsoring agency; careful screening at this stage can save all parties considerable money.

C. Select those individuals and/or agencies who are most interested and best qualified to do your work.

Step 5. Prepare the RFP.

A. Specify the evaluation problem in one or two sentences.

B. Provide background information on the training population (e.g. age, educational background, work experience).

C. State the type of evaluation you want conducted by mode and by type (e.g. training process and training outcome evaluation for X course).

D. Provide evaluator with copy of the training materials to be used for instruction.

E. Specify the work task for the bidder. (The following are samples:)

1. Indicate the general type of evaluation items you want used.
    - a. Multiple choice items.
    - b. Scalable items.
    - c. Forced choice.
    - d. Case problem, etc.

    (See Exhibit Y for samples of evaluation items.)
2. Specify timetable for your review of items prior to use.
3. Specify any pilot test requirements you may have.

F. Specify time schedule, budget format, personnel qualifications.

Step 6. Send out RFP's.

Step 7. Review and rate proposals.

Step 8. Decide on subcontractor.

Step 9. Negotiate a contract based on proposal.

Step 10. Monitor evaluation study in process according to contract.

Step 11.-Review final reports to determine compliance with original contract.

How to Rate Contract Proposals[1]

RFP re: Date:

Name of Contractor: Total Rating Points:

Items: Contractor Qualifications

1. Professional qualifications ______
   Project manager
   Technical support personnel
2. Experience in evaluation area ______
   Prior evaluation work
   Related research or development work

Proposal Qualifications

1. Clarity of evaluation procedures ______
2. Congruence of evaluation study with training goals and objectives ______
3. Congruence of evaluation activities with your specifications ______
4. Acceptability of evaluation activities to trainee population ______
5. Provisions for evaluation feedback to trainees, instructors and sponsoring agency ______

Budget and Time Schedule

1. Reasonableness of cost proposal ______
2. Acceptability of check points in the evaluation process ______
3. Acceptability of other items ______

Total Rating ______

---

[1] Adapted from Otto and Glaser (1970).

Rate each of the items as follows:

5 for quality that exceeds expectation

4 for highly acceptable quality

3 for acceptable quality

2 for marginally acceptable quality

1 for unacceptable quality

Note: The rating scale is provided as a means to assist in the screening of the overall quality of proposals. In the final analysis, one should screen very carefully several times, those few proposals that are of highest quality. Final decisions for selection of a contractor, when there are several competing bids, may be such variables of personal compatibility of project officers, distance from sponsoring agency and the like.

B. Criteria for Monitoring and Judging the Quality of an Evaluation Subcontract

If the activities and steps used to implement the DOES are followed, as specified in the Handbook, the monitoring of evaluation studies is made easy. All the monitor must do is to make sure that the steps are being followed as outlined in the Handbook and in the contract.

The judgment of quality of an evaluation study is also facilitated by the activity lists provided in the handbook, for evaluation by each mode and stage. In many instances, reference sources are suggested for review. These sources provide good examples of objectives, evaluation instruments, and the like. A comparison of the work of the subcontractor with examples in these sources (e.g. the Bloom and Krathwohl Taxonomies of Educational Objectives) provide a basis for judgment of quality.

From a quite different perspective, the sponsoring agency should judge the quality of an evaluation subcontract on the basis of very practical criteria. The practical criteria of relevance, importance, scope, credibility, and timeliness (Stufflebeam, 1971) are very important quality criteria.

Relevance--Are the data presented by the contractor relevant to the purposes intended? Do you perceive the data to be relevant?

Importance--Are the data presented by the contractor really important to you? Have you been given too much information such that it is difficult to weed out the unimportant from the important?

Scope--Are the data presented to you by the contractor (assuming that they are relevant and important) equal to the scope of the problem being investigated? Are the data too narrow in scope to be useful? Did the contractor ignore important sources of data, from your perspective? Are the data too broad in scope to be useful?

Credibility--Are the data presented to you by the contractor believable? Will they be "believed" by your superior? Are the data relevant, important, adequate in scope? Are you willing to "stand up and be counted" with the data you have from the subcontractor?

Timeliness--Did the subcontractor deliver his data on time? Was the timing of data delivery useful to you in the internal decision-making processes of your agency?

From the perspective of measurement and evaluation specialists, the quality of an evaluation study would depend upon the criteria of validity and reliability. In this sense, validity refers to the "quality" of data, data gathering research design, and the conclusions drawn from the data. Reliability refers to the consistency of the data gathered. Reliability is best reflected in the statement, "If new data were gathered, would the results likely be the same?"

If a sponsor would like to place judgments of quality on an evaluation study from an evaluation methodology perspective, it would be wise to hire another evaluator to "audit" the work of your subcontractor. This would probably provide the best means to judge the quality of an evaluation subcontract.

Reporting of Decision Information

The guiding principle in this study has been that evaluation is the process of identifying, obtaining and using information to judge, and select among, decision alternatives. Evaluation is a complex technical process that yields technical information. Yet technical information alone is not all that the decision maker needs. The vital link between evaluation and action selection is the decision information system. To be compatible with the decision maker's requirements, technical evaluation information must be partitioned, translated and displayed in accordance with his requirements and constraints. Technical information needs to be translated into the meaning system of the decision maker. The results of this translation produce decision information that is:

1) On target - decision information that provides the decision maker with the kind of information he needs.
2) Of sufficient quality - information that is adequate for making decisions without overloading the decision maker.
3) Timely - decision information that is produced and disseminated promptly with sufficient lead time in advance of important decision deadlines.
4) Sensitive - decision information that is responsive to community needs and appropriate to the requirements of training developers and training administrators to keep programs on target, and congruent with training goals.

The decision maker will require technical evaluation information in the form of technical reports and accompanying technical abstracts. The technical level of reporting presents the procedures used in evaluation, data analyses and summaries, instrumentation, and interpretation of results in technical terms. Decision information is of quite a different kind and the result of translation of technical information into ratings of training quality and includes cost data as well.

To accomplish effective translation and reporting of decision information will require involving the decision maker in the design of the reporting system and the decision information formats.

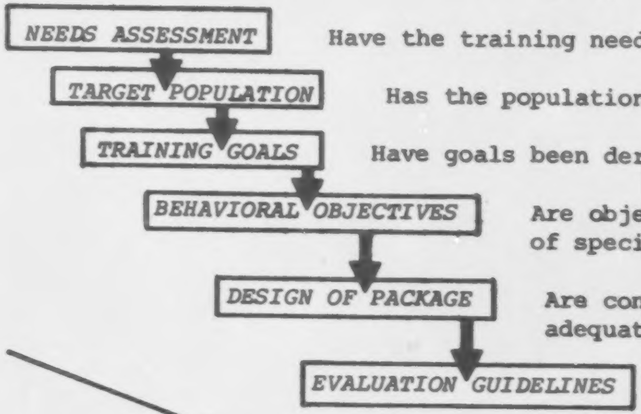
Pilot formats for reporting decision information have been developed. These are the Decision Information Summaries (DIS) shown in Figures 3 through 7 . The partitioning of information is in terms of the evaluation modes. There are two forms for training mode evaluation: Training Materials Evaluation (Fig. 3) and Training Process Evaluation (Fig. 4). There is one DIS for the Job Performance mode and one for community impact (Figs. 5 and 6). Finally, there is a DIS for compiling the results of the multi-mode evaluation into a single format to provide a comprehensive summary of quality, costs, and recommendations for specific training activities.

The information for determining quality ratings for the decision information summaries comes from the application of criteria and guidelines for evaluation. Pilot criteria and guidelines have been developed for training materials and training process evaluations, but have not yet been explicitly developed for job performance and community impact. Each DIS for each mode has several parameters of evaluation highlighted in the boxes on the left of each DIS format. For example, the DIS for Training Materials Evaluation has the following parameters: needs assessment, target population, training goals, behavioral objectives, design of package, and evaluation guidelines. Quality ratings are applied to each parameter for each mode of evaluation. The ratings are on a seven point scale from one (inadequate) through four (marginal) to seven (adequate). Ratings are to be based on the judgments of the evaluators from applying the criteria and guideline. Each DIS includes a graphic rating scale (from one to seven) for overall evaluation for that mode. The overall evaluation of quality is based on a weighted average of the ratings on each parameter within the particular evaluation mode. The DIS for comprehensive evaluation has as its parameters the ratings from each of the four decision information summaries. The final comprehensive evaluation is based on the weighted average of the overall quality ratings from the four decision information summaries for the three modes of evaluation. The total costs for training and evaluation for the particular training activity will be included on the comprehensive evaluation DIS.

Finally, attached to the DIS for comprehensive evaluation will be a summary of the major technical results indexed to the technical report and a list of specific recommendations indexed to the decision information summaries for each evaluation mode.

DECISION INFORMATION SUMMARY: Training Materials Evaluation   Figure 3

"What do decision makers and training developers need to know about development of Training Materials?"


NEEDS ASSESSMENT
TARGET POPULATION
TRAINING GOALS
BEHAVIORAL OBJECTIVES
DESIGN OF PACKAGE
EVALUATION GUIDELINES

Have the training needs been identified and expressed?................ ______

Has the population of trainees for this program been specified? ... ______

Have goals been derived from needs assessment?..................... ______

Are objectives derived from goals and stated in terms of specific behaviors?................................. ______

Are content, format, organization and strategy adequate?... ______

Application of detailed guidelines to evaluation of quality of training materials

OVERALL EVALUATION OF QUALITY OF TRAINING MATERIALS

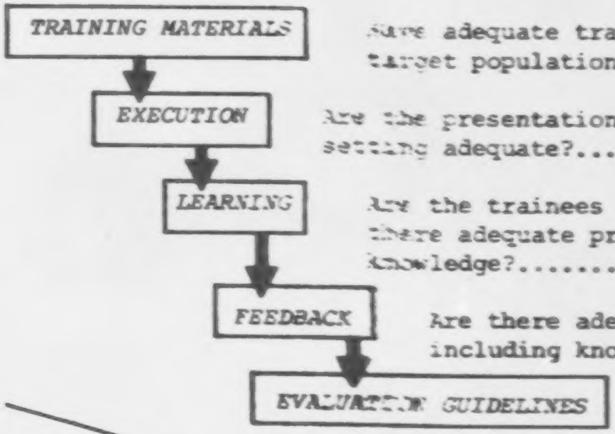
1	2	3	4	5	6	7
Inadequate			Marginal			Adequate

Cost of training development including evaluation $____

Recommendation: ☐ Continue ____ ☐ Modify ____ ☐ Terminate ____ Program

DECISION INFORMATION SUMMARY: Training Process Evaluation **Figure 4**

"What do decision makers and training developers need to know about the Training Process?"



Have adequate training materials been developed for the appropriate target population?.. ______

Are the presentation of materials, length of training and training setting adequate?.. ______

Are the trainees adequately involved in the learning process? Is there adequate provision for skill practice and display of knowledge?.. ______

Are there adequate provisions for reinforcement of learning, including knowledge of results and self-evaluation?................. ______

Effectiveness of training process is related to trainees' competence and confidence in relation to goals and objectives of training.

OVERALL EVALUATION OF QUALITY OF TRAINING PROCESS

1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐
Inadequate			Marginal			Adequate

Cost of operating program (per student) $____

Cost of training process evaluation $____

Recommendation: Continue ____ Modify ____ Terminate ____ Program

DECISION INFORMATION SUMMARY: Job Performance Evaluation

Figure 5

"What do decision makers and training developers need to know about the evaluation of Job Performance?"

JOB ANALYSIS Has the trainee's job been adequately employed to derive the specific skills and knowledge required for performance on the job?...................... ____

TRAINING REQUIREMENTS Have the specific skills and knowledge required for the job been translated into training goals and behavioral objectives?...... ____

PERFORMANCE MEASURES Are the indicators and measures for job performance congruent with the established goals and objectives of the training program?.. ____

OBSERVATION OF PERFORMANCE Has the performance behavior referenced in training been sampled adequately on the job?.............. ____

TRANSFER OF TRAINING Did the training program result in positive transfer effects to job performance in terms of trainees' competence, confidence and attitudes? ____

EVALUATION GUIDELINES Quality of training program is assessed in relation to its effects on improved job performance.

OVERALL EVALUATION OF QUALITY OF JOB PERFORMANCE

☐	☐	☐	☐	☐	☐	☐
1	2	3	4	5	6	7
Inadequate			Marginal			Adequate

NO EVIDENCE

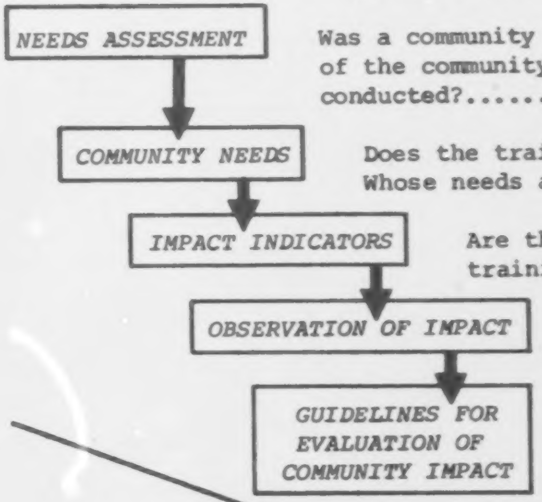
☐ Data limited or unavailable

Cost of job performance evaluation $____

Recommendation: Continue ____ Modify ____ Terminate ____ No recommendation possible ____

DECISION INFORMATION SUMMARY: Community Impact Evaluation **Figure 6**

"What do decision makers need to know about the evaluation of Community Impact?"


NEEDS ASSESSMENT
COMMUNITY NEEDS
IMPACT INDICATORS
OBSERVATION OF IMPACT
GUIDELINES FOR EVALUATION OF COMMUNITY IMPACT

Was a community needs assessment conducted? What was the origin of the community needs assessment? How was the needs assessment conducted?.. _____

Does the training program arise out the community needs assessment? Whose needs are being met by the training program?..................... _____

Are the indicators of community impact congruent with the training program and of reasonable sensitivity?................. _____

Was the sampling of community impact adequate in terms of timeliness and scope?.......................... _____

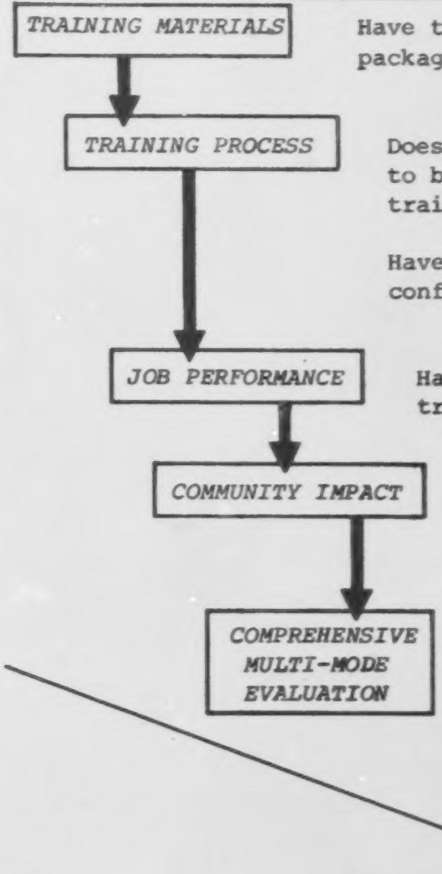
Assessment of training program in increasing the ability of local government to respond to community needs.

OVERALL EVALUATION OF QUALITY OF COMMUNITY IMPACT								NO EVIDENCE
	☐	☐	☐	☐	☐	☐	☐	☐
	1	2	3	4	5	6	7	
	Inadequate			Marginal			Adequate	Data limited or unavailable

Cost of community impact evaluation $_____

Recommendation: Continue _____ Modify _____ Terminate _____ No recommendation possible _____

DECISION INFORMATION SUMMARY: Comprehensive Evaluation Figure 7



Have the guidelines for evaluating the training package been applied?.. ______
Quality rating ______

Does the evaluation of the training process show the process to be congruent with the goals and objectives of the training activity?.. ______

Have the trainees experienced improved competence and confidence?.. ______
Quality rating ______

Has the evaluation of job performance shown a positive transfer of training to the job situation?................ ______
Quality rating ______

Has the evaluation of effects of performance of services in the community shown an increase in the ability of local government to respond to community needs?........ ______
Quality rating ______

Systematic unified application of evaluation guidelines for training package, training process, job performance and community impact to arrive at a total comprehensive evaluation of the quality of training.

COMPREHENSIVE EVALUATION OF QUALITY OF TRAINING PROGRAM

☐	☐	☐	☐	☐	☐	☐
1	2	3	4	5	6	7
Inadequate			Marginal			Adequate

Total cost of comprehensive evaluation $

Recommendation Continue ____ Modify ____ Terminate ____ Comment:

Summary and Recommendations for Future Development

The CATE project has focused on the development of an evaluation system for Title VIII community development training. Phase I, system development, was the result of 3.6 man-years of effort culminating in a prototype system design which has been partially pilot tested. During the eleven months of the project, members of the project staff visited 38 sites conducting training and evaluation; contacted and interviewed 55 professional individuals involved in training system development and evaluation, and reviewed 878 research and development documents related to training and evaluation.

The development of the evaluation system is described in this final report. The tangible procedures for application of the system have been brought together in the form of a users' handbook (*Decision-Oriented Evaluation System: Handbook for Community Development Training Evaluation*) (or *DOES Handbook* for short). The DOES handbook addresses evaluation problems in the total training system context. This system context perspective sees training and evaluation as highly integrated, and indeed inseparable, parts of a larger system which begins with community needs assessment and ends with program action decisions. The evaluation principle is not to determine whether any training (or the trainee) is good or bad, but rather what specific actions can be taken to deliver what is needed to the system. From the perspective of this project, evaluation is seen as a collection of dynamic and adaptive process mechanisms that provide continuous feedback to *all* components for modification and improvement of total system performance. Methodologies have been researched and translated in the handbook into applied procedures for evaluation in the following modes:

Mode 1. Training Evaluation which has two sub-modes

  a. Training Development Evaluation

  b. Training Process Evaluation

Mode 2. Job Performance Evaluation

Mode 3. Community Impact Evaluation.

Overlaying the three modes of evaluation are three phasic components: input stage, process stage and outcome stage. The input stage refers to those procedures and steps which should be taken by trainees and evaluators prior to the actual process of training. These procedures and steps are to insure standards for both training and evaluation before the program is executed. The process stage embodies procedures for evaluation while activities are in action during training, on the job, and in the community. Finally, the net result of training activities are evaluated through procedures set forth in the outcome stage. Feedback information is returned to the other system components, especially developers and training activity administrators, during each stage. This modes-by-stages conceptual organization generates a nine-cell matrix of procedures which is the core of operationalizing the evaluation system (DOES).

Since evaluation takes place within the context of a larger system, operationalizing the evaluation components cannot be fully effective unless problems associated with the other system components are addressed. Therefore, consideration must be given to developing effective needs assessment, performing job and task analyses, contracting guidelines for training development and evaluation development, and translation of technical information to decision information. From the DOES perspective these latter components are supporting components and are precursors to the ultimate effective development of DOES.

In summary, the operational procedures for system application have been developed for the evaluation components as well as the supporting components of the total system. These operational procedures along with a variety of evaluation and decision-making guidelines are organized and presented in prototypic form in the DOES handbook. Since the system is at the prototype stage, further development and testing of course will be required before final operationalization and installation. However, the DOES handbook is sufficiently developed at this stage to carry out such operational field-testing. It is anticipated that such field testing will produce significant modifications in the handbook. Modification is to be expected and welcomed simply because the system has not yet been tried out in an operational setting.

Even though the system has not been tested there are a number of substantive recommendations based on the project's research effort that can be put forth at this time.

1. Training evaluation. The most productive area of inquiry has been the field and training of instructional systems development and evaluation. There is a vast body of literature on training and instruction and a great deal can be translated and applied to TDCA training problems. It is highly recommended that efforts be concentrated in this area to achieve high quality training. Improvement in training quality would lead to more effective job performance measurement and provide better opportunities to trace training effects into impact on the community.

2. Job performance evaluation. Job performance measurement is a complex endeavor to say the least. Effective measurement of the transfer effects of training to the job depends on a number of interrelated variables. Among these are the level of specific skill training, the length of the training course, the amount of skill practice in training, the intervening time between training and measurement, and, most important, the method of measurement. In general, training activities that are not focused on specific skill training are most difficult to evaluate in the job performance mode because of dilution and consequent difficulty of observing transfer of training effects. The same is true for training that is of short duration or does not provide skill practice. The problem with intervening time between training and evaluation is that the longer this time the more opportunity there will be for causes other than the specific training activity to exert themselves, such as informal on-the-job instruction.

The most serious problem in measuring job performance resides in the kind of measuring instrument to be used. The ideal and most effective means of measuring job performance are performance tests. The least effective are descriptive opinions. Somewhere in between lie rating scales. Well constructed performance tests allow for objective observation and measurement of specific task performance. They can be, and often are, sturdy and effective bridges between training and on-the-job performance by insuring consistency between the performance requirements of the job and training objectives for that job. Performance tests provide the most valid criteria for evaluating and modifying training. Performance tests have another large pay-off: they are excellent training devices. On the other hand, performance tests are costly in terms of time and materials to develop. They are also costly to administer. Except for their use in the armed services, the costs of performance tests have prevented wide-scale usage.

Unfortunately most evaluation of job performance falls back on the use of rating devices. Ratings, while the least expensive means of performance measurement, are also among the least valid.

Two recommendations are put forth:

(a) Where possible, investment should be made in developing and constructing inexpensive performance tests; and

(b) If rating scales are to be used, the evaluator should base these scales on the analyses of job tasks and insure that the raters are well trained.

3. Community impact evaluation. While there has been a great deal of theory written in the past decade on the topic of community impact indicators within the social science field, little of this is on the practical side. The problem of achieving effective impact evaluation is still fraught with methodological problems from an evaluator's perspective and with definitional problems from the social scientist's perspective. In practical terms, this is the criterion problem of what to measure that is specifically associated with training. The problem is similar to the problem of measuring job performance only more serious.

The recommendation for community impact measurement would be to use where possible natural process records. Such records are often kept by government agencies and offer the best existing framework, currently, for data gathering on impact evaluation. While most of the data available in goverment agencies may appear to be indirect to the problems such data are usually easily accessible, and until the field becomes more sophisticated, they offer good prospects.

Analyses of citizen complaints can provide a good measure of quality of life in a community. To be recommended is the development of such systems as those employed by Mayor Hubbard of Dearborn, Michigan and the Mayor's Office of Information and Complaints in the city of Philadelphia.

In summary, the research conducted on the CATE project to date allows the listing of the following recommendations for TDCA:

1. Training: employ criteria and guidelines for evaluation of training development and training process to improve the quality of training.
2. Job performance: develop performance tests as means of obtaining valid measures of transfer of training effects, to insure consistency of job performance requirements and training objectives, and to provide learning tools. Use task-specific rating scales.
3. Community impact: investigate natural process records as a criterion source for evaluating training as it affects the community. Develop a system for obtaining and analysing citizen complaints for a measure of training effectiveness as it affects the quality of life in the community.

BIBLIOGRAPHY

Abt, C. C. An approach to methods of combined sociotechnological forecasting. Technological Forecasting and Social Change, 1970, 2, 17-22.

Air Training Command. Guide for special training. ATC Manual 52-9, Randolph AFB, Texas: Department of the Air Force, Headquarters Air Training Command, January 31, 1972.

Air Training Command. Planning, preparation, and quality control of career development courses. ATC Manual 52-2, Randolph AFB, Texas: Department of the Air Force, Headquarters Air Training Command, December 15, 1972 (Effective January 1, 1973).

Air University, Directorate of Curriculums. The use of technology to instruct institutions of higher education. M-42252-4-U, AUL/LRX, Maxwell AFB, AL 36112, 1970.

Air University, Directorate of Evaluation and Special Studies. Summary of the present AFROTC curriculum. M-42253-3-U, AUL/LRX, Maxwell AFB, AL 36112, 1967.

Air University, Directorate of Evaluation and Special Studies. Survey of air force management education and training. M-42253-U, AUL/LRX, Maxwell AFB, AL 36112, 1967.

Air University Extension Course Institute. Management for air force supervisors. Vol. 2, MGT-#17, 00006 02 1061 0667, Gunter AFB, Alabama. (undated)

Air University Study Group. Twenty years of reading instruction in the Air University. 372, 413, A2982t, AUL/LRX, Maxwell AFB, AL 36112, 1968.

Alberts, D. S. A plan for measuring the performance of social programs. New York: Praeger Publishers, 1970.

Alberts, D. S. An operations research approach to measuring the performance of social programs. A Paper Presented at the Annual Meeting of the Ohio Valley Sociological Society, Cleveland, Ohio, April 1971.

Albrecht, G. L. Agents of social change and social conflict in developing countries: Indigenous health professionals and paraprofessionals in Iran and Kenya. Atlanta: Emory University, 1972.

Allen, B. D. et al. An analysis of regional centralization of base level logistics computer operation. SLSR-54-67. AFIT/L, Wright-Patterson AFB, Ohio, 45433, 1968.

Allen, J. R. An analysis of aircrew coordination. M-35582-7-U, A 4271a, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Allen, L. A. Principles of program planning for training adults. Presentation at the Educational Program for Public Library Personnel, University of Kentucky, February 1969. (ERIC ED 045 950.)

Allerhand, M. F. et al. A study of impact and effectiveness of the comprehensive manpower project of Cleveland. (AIM-JOBS). Vol. 1. Summary. Vol. 2. Technical Report. Vol. 3. Appendices. Cleveland: Case Western Reserve University, December 1969. (ERIC ED 042 117.)

Aman, E. D. Flying safely in spite of the birds. M-35582-7-U, A 484f, Research Study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Ammentorp, W. et al. Training for development and evaluation in education. The proposal for the midwest educational training center. Contract no. OEC-3-7-06 28 70-3069, Minneapolis: Upper Midwest Regional Educational Lab, Inc., December 1970. (ERIC ED 056 413.)

Anderson, C. A. Effectiveness measures. M-32983-U, A5451e, Professional study no. 3266, AUL/LRX, Maxwell AFB, AL 36112, 1967.

Anderson, C. M. et al. Approaches to the analysis of social service systems. In E. E. Schwartz (Ed.), *Planning-programming-budgeting systems and social welfare*. Chicago: The University of Chicago, The School of Social Service Administration, 1970.

Anderson, C. T. The tactical fighter pilot: Improving combat effectiveness. M-32983-U, A5452t, Professional study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Anderson, J. G. Social indicators and second order consequences: Measuring the impact of innovative health and medical care delivery systems. Research Memorandum no. 71-7, Lafayette, Indiana: Purdue University, School of Industrial Engineering, 1971.

Anderson, J. G. Causal models and social indicators: Toward a social systems model. Lafayette, Indiana: Purdue University, 1972.

Anderson, W. How effective is human relations training for the first-line supervisor. Personnel, 1963, 40, 62-66.

Andrews, R. L. Utilization of a selection criteria for screening applicants for administrative training for the prediction of patterns of predecisional behavior at the end of the training period. Paper Presented at the American Educational Research Association Annual Meeting, Minneapolis, Minnesota, 1970. (ERIC ED 041 390.)

Andrzejewski, N. Social indicators and accounting: Bibliography and work in progress. Unpublished manuscript, Ithaca, New York: Cornell University, Department of Rural Sociology, 1970.

Argyris, C. Explorations in interpersonal competence-I. Journal of Applied Behavioral Science, 1965, 1, 58-83.

Arkansas University, College of Education. Guide to improving vocational education evaluation. Fayettville, Arkansas, December 1970. (ERIC ED 047 153.)

Armstrong, G. R. & Dougherty, P. J. A study of the development of output measures. SLSR-24-71A, AFIT/L, Wright-Patterson AFB OH 45433.

Armstrong, R. H. & Hobson, M. The use of games in planning. Long Range Planning, 1972, 5 (1), 62-66.

Arnold, J. K. A revised training and evaluation program for SAC minuteman missile combat crew members. M-35582-7-U, A756r, Research study no. 0075-71, AUL/LRX, Maxwell AFB, AL 36112.

Ascher, C. The administration of publicly-aided housing. *Public Administration*, London: Journal of the Royal Institute of Public Administration, Autumn 1972.

Aslin, C. H. An analysis of aircrew standardization in the Strategic Air Command. M-35582-7-U, A835a, Thesis no. 0055-67, AUL/LRX, Maxwell AFB, AL 36112, 1967.

Baker, K. D. So you want to be a supervisor? *Bureau of Narcotics and Dangerous Drugs Personnel Management Series*, 1972, *16* (1).

Baker, M. R. United States Air Force physical fitness: Past, present, and future. M-35582-7-U, B168a, Thesis no. 0065-68, AUL/LRX, Maxwell AFB, AL 36112, 1968.

Baker, R. L. Educational innovation: Research and evaluation techniques. Report of 1967 Summer Institutes, Inglewood, California: Southwest Regional Educational Lab., 1970. (ERIC ED 044 387.)

Bass, B. M. & Vaughan, J. A. Training in industry: The management of learning. Monterrey, California: Brooks Cole, Division Wadsworth Pub. Co., 1966.

Bass, D. D. The development of future air force managers. M-32983-U, B3171d, Professional study no. 4070, AUL/LRX, Maxwell AFB, AL 36112.

Batchelor, P. G. Faith and farm: Community orientated rural training in Nigeria. *Community Development Journal*, 1970, *5* (2), 79-84.

Bauer, R. A. (Ed.) *Social indicators*. Cambridge, Massachusetts: The Massachusetts Institute of Technology Press, 1966.

Bauer, R. A. Social indicators and sample surveys. *Public Opinion Quarterly*, 1966, *30*, 339-352.

Bauer, R. A. Societal feedback. *The Annals of the American Academy of Political and Social Science*, 1967, *373*, 180-192.

Bauer, R. A. Social indicators: Or, working in a society which has better social statistics. In S. Anderson (Ed.), *Planning for diversity and choice: Possible futures and their relations to the man-controlled environment*. Cambridge, Massachusetts: Massachusetts Institute of Technology Press, 1968.

Bauer, R. A. & Bauer, A. H. America, mass society and mass media. *The Journal of Social Issues*, 1960, *16*, 3-66.

Bauman, D. J. et al. A guide to the instruments developed for evaluation of in-service institutes. April 1970. (ERIC ED 055 792.)

Bauman, Z. Uses of information: When social information becomes desired. *The American Academy of Political and Social Science*, 1971, *393*, 20-41.

Bayton, J. A. & Chapman, R. L. *Transformation of scientists and engineers into managers*. NASA SP-291, Washington, D. C.: NASA.

Beal, G. M., Brooks, R. M., Wilcox, L. D., & Klonglan, G. E. Social indicators: Bibliography I, sociology report no. 92. Ames, Iowa: Iowa State University, Department of Sociology and Anthropology, 1971.

Beal, G. M., Klonglan, G. L., et al. Social indicators and public policy: Toward an alternative approach. A Paper Presented at the Annual Meeting of the American Sociological Association, Denver, Colorado, September 1971.

Bell, D. The measurement of knowledge and technology. In E. B. Sheldon & W. Moore (Eds.), *Indicators of social change: Concepts and measurements*. New York: Russell Sage Foundation, 1968.

Bennett, M. K. On measurement of relative national standards of living. *Quarterly Journal of Economics*, 1937, February, 317-335.

Berdie, R. F. Consistency and generalizability of intra-individual variability. *Journal of Applied Psychology*, 1969, *53*, 35-41.

Bernstein, B. R. & Gonzales, B. K. Learning, retention, and transfer: I. *NAVTRADEVCEN Technical Report*, 68-c-0215-1, 1971.

Berry, N. H., Nelson, P. D., & McNally, M. S. A note on supervisor ratings. *Personnel Psychology*, 1966, *19*, 423-426.

Bhola, H. S. Innovation research and theory. U. S. Office of Education contract no. OE-5-10-307, Columbus, Ohio: Ohio State University, School of Education, Educational Development Division, 1965.

Bhola, H. S. Configurations of change, an engineering theory of innovation diffusion, planned change and development. Bloomington, Indiana: Indiana University, Comparative Education Department, 1972.

Biderman, A. D. National goals and statistical indicators. Washington, D. C.: Bureau of Social Science Research, Inc., 1963.

Biderman, A. D. Kinostatics for social indicators. Washington, D. C.: Bureau of Social Science Research, Inc., 1971.

Bird, L. L., Jr. Air force reserve officers' training corps: An analysis of its problems with cost and responsiveness. M-35582-7-U, B618a, Thesis no. 0090-68, AUL/LRX, Maxwell AFB, AL 36112, 1968.

Bixhorn, H. Cluster analysis: An application to typology of urban neighborhoods. A Paper Presented at the Annual Meeting of the American Statistical Association, Fort Collins, Colorado, 1971.

Black, D. & Bottenberg, R. A. Comparison of technical school and on-the-job training as methods of skill upgrading. D301.45/27, 70-48, San Antonio, Texas: Lackland AFB, Personnel Division, December 1970.

Blackwell, N. An analysis of the impact of advancing electronics technology on air force technician training. M-35582-7-U, B6322a, Research study no. 0120-70, AUL/LRX, Maxwell AFB, 1970.

Blaisdell, T. C. Problems of evaluating the effectiveness of development measures. Economic Development and Cultural Change, 1954, 2, 286-297.

Blumberg, H. H., DeSota, C. B., & Kuethe, J. L. Evaluation of rating scale formats. Personnel Psychology, 1966, 19, 243-259.

Blumenthal, M. D. Alienation and violence for social change. A Paper Presented at the 13th Canadian-American Seminar Program, Windsor, Ontario, Canada, November, 1971.

Blumenthal, M. D. & Andrews, F. M. Resentment and suspicion. Ann Arbor, Michigan: The University of Michigan, Institute for Social Research, 1970. (a)

Blumenthal, M. D. & Andrews, F. M. Valves: Retributive justice, self-defense, kindness. Ann Arbor, Michigan: The University of Michigan, Institute for Social Research, 1970. (b)

Blumenthal, M. D., Kahn, R. L., & Andrews, F. M. Attitudes toward violence. Ann Arbor, Michigan: The University of Michigan, Institute for Social Research, 1971.

Bohrer, R. R. The air force and human relations. M-35582-7-U, B677a, Thesis no. 0205-67, AUL/LRX, Maxwell AFB, AL 36112, 1967.

Bolby, R. L. & Schriver, W. R. Nonwage benefits of vocational training: employability and mobility. Industrial and Labor Relations Review, 1970, 23 (4), 500-509.

Bolton, C. K. & Corey, K. E. A selected bibliography for the training of citizen-agents of planned community change. Revised Edition, Exchange Bibliography #206, Monticello, Illinois: Council of Planning Librarians, August 1970. (ERIC ED 056 957.)

BonJean, C. M., Hill, R. J., & Melemore, S. D. Sociological measurement: An inventory of scales and indices. San Francisco, California: Chandler Publishing Co., 1967.

Boos, A. G. Increased pilot production: Where do we go from here? M-35582-7-U, B72421, Research study no. 0135-70, AUL/LRX, Maxwell AFB, AL 36112, 1970.

Boruch, R. F. & Creager, J. A. A note on stability of self-reported protest activity and attitudes. Measurement and Evaluation in Guidance, 1972, 5 (2), 332-338.

Boruch, R. F. & Wolins, L. Procedure for estimation of trait, method, and error variance attributable to a measure. Educational and Psychological Measurement, 1970, 30, 547-574.

Boruch, R. F., Larkin, J. D., Wolins, L., & MacKinney, A. Alternative methods of analysis: Multi trait-multi method data. Educational and Psychological Measurement, 1970, 30, 833-853.

Borus, M. E. & Buntz, C. G. Problems and issues in the evaluation of manpower programs. Industrial and Labor Relations Review, 1972, 25 (2), 234-245.

Boucher, W. I. The future environment for technology assessment. In M. J. Cetron & B. Bartocha (Eds.), Technological assessment in perspective. Paris, France: Hermann Press, 1971.

Boyd, B. B. & Jensen, J. M. Perceptions of the first-line supervisor's authority: A study in superior-subordinate communication. Academy of Management Journal, 1972, 15 (September), 331-342.

Brady, E. L. & Branscomb, L. M. Information for a changing society. Science, 1972, 175, 961-966.

Brady, H. Social indicators: Report and bibliography. Washington, D. C.: National Science Foundation, Division of Social Sciences, 1970.

Bratt, E. C. Economic growth and fluctuations. The Annals of the American Academy of Political and Social Science, 1971, January, 121-131.

Brecher, J. D. Improvement of tactical fighter continuation training. M-35582-7-U, B8291i, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Breckner, W. J. & Baird, O. B. Programmed instruction for operational aircrew continuation ground training: Adjunct to self-study. M-35582-7-U, B829p, Research study no. 0185-70, AUL/LRX, Maxwell AFB, AL 36112, 1971.

Bristol, C. D., Jr. An improved flight evaluation system for SAC. M-32983-U, B861, Professional study no. 3884, AUL/LRX, Maxwell AFB, AL 36112, 1970.

British Ministry of Labor, Central Training Council. Development of managers--further proposals. Report by the Central Training Council of the Management Training and Development Committee, London, 1969. (ERIC ED 031 647.)

Brittain, C. New technology and the air force transportation officer--will he be equal to the challenge? M-35582-7-U, B862n, Thesis no. 0260-67, AUL/LRX, Maxwell AFB, AL 36112, 1967.

Bronnenberg, G. E. & Golly, R. T. An analysis of milstrip training and its effect on milstrip requisition errors. SLSR-6-67, AFIT/L, Wright-Patterson AFB, OH 45433, 1968.

Brooks, R. M., Wilcox, L. D., Beal, G. M., & Klonglan, G. E. Toward the measurement of social indicators: Conceptual and methodological implications. Proceedings of the Social Statistics Section, Washington, D. C.: American Statistical Association, 1971.

Brubaker, R. D. They're in the army now. M-32983-U, B886t, Professional study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Bruno, J. E. A methodology for the evaluation of instruction or performance contracts which incorporates school district utilities and goals. _American Education Research Journal_, 1972, _9_ (2), 175-195.

Bryan, C. H. & Bertrand, A. L. Propensity for change among the rural poor in the Mississippi Delta: A study of the roots of social mobility. Agricultural Economic Report no. 185, Washington, D. C.: Economic Research Service, U. S. Department of Agriculture, 1972.

Budd, R. Technology unemployment. M-32983-U, B927t, Professional study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Bureau of Labor Statistics. Planning and administration personnel in local governments. A Pilot study, Report no. Bulletin-1631 Washington, D. C., June 1969. (ERIC ED 040 282.)

Bureau of National Affairs, Inc. Training employees. Washington, D. C., 1969. (ERIC ED 038 608.)

Burke, D. J. An investigation of the use of the case method in performance appraisal training. M-35582-7-U, B9591i, Thesis no. 0280-67, AUL/LRX, Maxwell AFB, AL 36112, 1967.

Burns, J. J. A summary report of the state of New York for the years 1969-71. Albany, New York: Office for Local Government, Executive Department, May 1971.

Burton, K. E. Improved ground training for SAC aircrews. M-35582-7-U, B97431, Research study no. 0210-70, AUL/LRX, Maxwell AFB, AL 36112, 1971.

Bush, J. W. & Fanshel, S. Basic concepts for quantifying health status and program outcomes. Unpublished manuscript, San Diego, California: University of California, 1970.

Butler, W. P. An analysis of the policies and procedures for the basic operational training of coast guard aviators. M-32983-U, B9871a, Professional study no. 3309, AUL/LRX, Maxwell AFB, AL 36112, 1967.

Byers, K. T. (Ed.) Employee training and development in the public service. Chicago: Public Personnel Association, 1970. (ERIC ED 049 421.)

Byram, H. M. A five-state try-out and demonstration program to determine the generalizability of an evaluation system for local programs of vocational and technical education. Final report, Contract no. OEG-0-8-070968-2829, East Lansing: Michigan State University, College of Education, February, 1971. (ERIC ED 049 386.)

Cabello, O. The use of statistics in the formulation and evaluation of social programmes. *Proceedings of the Social Statistics Section, American Statistical Association*, Washington, D. C., 1959.

Cain, G. G. & Hollister, R. G. The methodology of evaluating social action programs. Madison: Wisconsin University, Center for Studies in Vocational and Technical Education, November 1969. (ERIC ED 044 611.)

Cain, K. M. Aircrew training costs vs. full mission simulator. M-32983-U, C1351a, Professional study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Calouste Gulbenkian Foundation. *Community work and social change: A report on training*. London: Longman Group Ltd., 1970. (ERIC ED 045 889.)

Calta, D. An evaluation of the initial level of preparation of today's logisticians. SLSR-18-71B, AFIT/L, Wright-Patterson AFB, OH 45433, 1972.

Campbell, D. T. Reforms as experiments. *American Psychologist*, 1969, *24*, 409-429.

Campbell, D. T. Considering the case against experimental evaluations of social innovations. *Administrative Science Quarterly*, 1970, *15* (1), 110-113.

Campbell, J. P. Personnel training and development. Minneapolis: Minnesota University, Department of Psychology, June 1970. (ERIC ED 042 348.)

Campbell, J. P. Personnel training and development. *Annual Review of Psychology*, 1971, *22*, 565-595.

Campbell, J. W. An analysis of system program training. M-35582-7-S, C188a, Thesis no. C325-67, AUL/LRX, Maxwell AFB, AL 36112, 1967.

Candeub, I. Proper training for planners. *Planning 1966*, Chicago: American Society of Planning Officials, 1966.

Carlton, S. T. & Brault, M. B. In-basket scoring manual. Princeton: Educational Testing Service, December 1971. (ERIC ED 059 275.)

Caro, F. G. (Ed.) *Readings in evaluation research.* New York: Russell Sage Foundation, 1971.

Carrol, S. J. & Taylor, W. H. A study of the validity of a self-observational central signaling method of work sampling. *Personnel Psychology*, 1968, *21*, 359-364.

Carron, H. J. The need for a lead-in fighter trainer. M-35582-7-U, C3195n, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Carter, G. W. Social indicators: A perspective of the social indicators movement. Paper Presented at the Annual Meeting of the Western Conference on the Uses of Mental Health Data, Newport Beach, California, October 1971.

Carter, J. T. A new type of manual aviator. M-32983-U, C3232Na, Professional study no. 4046, AUL/LRX, Maxwell AFB, AL 36112, 1970.

Cash, E. G. Educational opportunities in the air force. M-32983-U, C3383e, Professional study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Catalanello, R. F. & Kirkpatrick, D. L. Evaluating training programs--the state of the art. *Training and Development Journal*, 1968, *22* (5), 2-9.

Center for Community Studies and the Nashville Urban Observatory. Social change and quality of life. A Report on a Conference, Nashville, Tennessee, May 7-9, 1970.

Center for Social Policy and Community Development. Curricula and training techniques for the training of paraprofessional employees of public housing authorities. Philadelphia: Temple University, January 1972.

Chafkin, S. H. et al. Measuring the impact of VISTA on poverty communities. Washington, D. C.: American Technical Assistance Corp., January 1969. (ERIC ED 044 632.)

Chaiklin, H. Evaluation research and the planning-programming-budgeting system. In E. E. Schwartz (Ed.), *Planning-programming-budgeting systems and social welfare*. Chicago: University of Chicago, School of Social Service Administration, 1970.

Chambers, A. N. Development of a taxonomy of human performance: A heuristic model for the development of classification systems. Silver Spring, Maryland: American Institutes for Research, 1969. (ERIC ED 033 292.)

Chant, R. J. A critical review of methods and techniques of instruction presently employed in the training of parachute packers. M-35582-7-U, C459c, Thesis no. 0185-68, AUL/LRX, Maxwell AFB, AL 36112, 1968.

Chilson, J. S. Occupational qualifications and success of on-the-job trainees. Columbus: Ohio State University, 1969. (ERIC ED 045 911.)

Clark, C. C. The need for a new weapons training center in the European theater. M-35582-7-U, C5921n, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Clark, H. F. Classrooms in the military: An account of education in the armed forces of the United States. New York: Bureau of Publications, Teachers College, Columbia University, 1964.

Clark, K. B. & Hopkins, J. A relevant war against poverty. New York: Harper & Row, 1969.

Clark, W. E. Community power and decision-making: A selective bibliography. Report no. CPL-ED-234, Monticello, Illinois: Council of Planning Librarians, 1971. (ERIC ED 058 518.)

Clifton, O. B. Methods of determining inservice training needs of beginning county extension agents. College Station, Texas: Texas A and M University, 1969. (ERIC ED 047 215.)

Clinton, L., Stauss, J. H. & Chadwick, B. A. An evaluation of a federal program for improving the employability of emigrants from Indian reservations. Pullman, Washington: Washington State University, 1972.

Cochran, W. G. Sampling techniques. New York: John Wiley and Sons, 1953.

Cohen, M. D., March, J. G. & Olsen, J. P. A garbage can model of organizational choice. Administrative Science Quarterly, 1972, 17 (1), 1-25.

Cohen, W. J. Education and learning. The Annals of the American Academy of Political and Social Science, 1967, 373, 79-101.

Coleman, F. E. A critique of the air force drug abuse education program. M-35582-7-U, C6922c, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Coleman, J. S. Resources for social change: Race in the United States. New York: Wiley Interscience, 1971.

Columbia University. Toward research on community action agencies: Key variables and research instruments. New York: Office of Economic Opportunity, Bureau of Applied Social Research, October 1966. (ERIC ED 058 353.)

Concannon, M. R. & Grate, R. E. The development and test of a job inventory for a job analysis of the 64XX supply officer utilization field. SLSR-1-70, AFIT/L, Wright-Patterson AFB, OH 45433.

Connally, J. W. A study of attrition in undergraduate pilot training. M-35582-7-U, C7525s, Research study no. 0405-71, AUL/LRX, Maxwell AFB, AL 36112.

Connecticut Department of Community Affairs. UCONN report first step in DCA training program. *Action*, July-August 1970.

Cook, J. A. Quantity or quality? An analysis of current UPT philosophy. AUL/LRX, Maxwell AFB, AL 36112, 1972.

Corgell, K. S. Counseling and the leader. M-35582-7-U, C8331c, Research study no. 0330-70, AUL/LRX, Maxwell AFB, AL 36112, 1970.

Cornblit, O., DiTella, T. S., & Gallo, E. A model for political change in Latin America. *Social Science Information*, 1968, *7*, 13-48.

Coroneos, P. P. Army officer procurement. M-35582-7-U, C797a, Thesis no. 0235-68, AUL/LRX, Maxwell AFB, AL 36112, 1968.

Corrigan, R. E. Methods-means selection: An inquiry/decision-making process approach. Paper Presented at Planning Conference, California Polytechnic, Los Angeles, 1969. (ERIC ED 037 817.)

Coster, J. K. & Morgan, R. L. The role of evaluation in the decision-making process. Center occasional paper no. 5, Raleigh, North Carolina University, Center for Occupational Education, 1969. (ERIC ED 042 028.)

Crafton, T. J. An analysis of nursing education. M-35582-7, C885a, Thesis no. 0490-67, AUL/LRX, Maxwell AFB, AL 36112, 1967.

Craig, R. L. & Bittel, L. R. (Eds.) *Training and development handbook*. New York: McGraw-Hill, 1967.

Crawford, T. M. The air borne forward air controller--peace time casualty. M-32983-U, C8991a, Professional study no. 3894, AUL/LRX, Maxwell AFB, AL 36112, 1970.

Crim, S. C. Prescription for developing military leadership. M-35582-7-U, C929p, Thesis no. 0265-68, AUL/LRX, Maxwell AFB, AL 36112, 1968.

Crist, J. A. Tactical fighter replacement training courses: An analysis. M-35582-7-U, C933t, Thesis no. 0500-67, AUL/LRX, Maxwell AFB, AL 36112, 1967.

Croll, J. A. The Hannibal community survey: A case study in a community development technique. Columbia, Missouri: Missouri University, School of Social and Community Services, 1969. (ERIC ED 042 101.)

Crum, J. M. & Turner, B. W. An analysis of the future role of full flight simulators in undergraduate pilot training. M-35582-7-U, C956a, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Currier, W. R. The citizen fighter pilot confirming an age-old heritage. M-35582-7-U, C976c, Research study no. 0360-70, AUL/LRX, Maxwell AFB, AL 36112, 1971.

Cushman, J. H. & Townsend, J. N. An analysis of the educational requirements of a wing level chief of aircraft maintenance in the disciplines of production management, communicative skills, and statistics. SLSR-35-71A, AFIT/L, Wright-Patterson AFB, OH 45433.

Dabbs, T. D. & Chadbourne, R. F. An analysis of the ALR-64830A supply systems computer specialist course. SLSR-8-67. AFIT/L, Wright-Patterson AFB, OH 45433, 1968.

D'Agostino, R. B. Social indicators: A statistician's view. A Paper Presented in the Symposium on Social Indicators at the Annual Meeting of the American Psychological Association, Boston University, September 1971.

Dalglish, R. L. A report on adult education programs San Antonio Junior College district for the school year 1971-1972 and projected programs for the school year 1972-1973. San Antonio, Texas: San Antonio College, Adult Distributive Education, 1973.

Daniel, D. M. Training strategy and the "system". Personnel Journal, 1972, 15, 413-417.

Darlington, R. B. & Stauffer, G. F. Use and evaluation of discrete test information in decision-making. _Journal of Applied Psychology_, 1966, _50_, 125-129.

Davidson, A. B. New concepts and problems in urban-inner city planning. _Managerial Planning_, 1972, _21_ (2), 21-26.

Davidson, F. P. Macro-engineering: A capability in search of a methodology. _Futures_, 1968, _1_, 153-161.

Davis, C. H. Pilot resource procurement and management concept. M-32983-U, D2613p, Professional study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Davis, S. L. Forward air controller continuation training. M-32983-U, D264f, Research report no. 3594, AUL/LRX, Maxwell AFB, AL 36112, 1968.

Dayton, R. D. Airborne psychological warfare in South Vietnam. M-35582-7-S, D276a, Thesis no. 0300-68, AUL/LRX, Maxwell AFB, AL 36112, 1968.

Deal, J. E. The method of training USAF MAAG advisor personnel: Is is [illegible]ective? M-35582-7-U, D279m, Research study no. 0393-70, AUL/LRX, Maxwell AFB, AL 36112, 1971.

Dean, M. E. An analysis of a human relations training program for squadron officer school section commanders. M-35582-7-U, D2821a, Thesis no. 0303-68, AUL/LRX, Maxwell AFB, AL 36112, 1968.

Deane, D. H. & Hammond, K. R. Acquisition and application of knowledge in complex inference tasks. _Journal of Experimental Psychology_, 1972, _92_ (1), 20-26.

Dearden, J. MIS is a mirage. _Harvard and Business Review_, 1972, _50_, 90-99.

DeFrank, D. A. The impact of personnel training and technical data preparation on maintainability of a weapon system. (M. B. A. Thesis, University of Chicago), 1965.

Demerath, N. J. Trends and anti-trends in religious change. In E. B. Sheldon & W. Moore (Eds.), Indicators of social change. New York: Russell Sage Foundation, 1968.

Demock, H. G. Sensitivity training as a method of increasing on-the-job effectiveness. Sociological Inquiry, 1971, 41 (2), 227-232.

DeNelsky, G. Y & McKee, M. G. Prediction of job performance from assessment reports: Use of a modified q-sort technique to expand predictor and criterion variance. Journal of Applied Psychology, 1969, 53, 439-445.

DeNeufville, J. I. Social indicator design and use. Unpublished Doctoral Dissertation, Massachusetts Institute of Technology, 1972.

Deneva, C. Training evaluation causes in behavior. Personnel Administration, 1969, 32 (5), 54-56.

Denton, D. L. The application of economic analysis to the problem of aircrew training. M. B. A. Thesis, the University of Chicago, 1967.

Department of the Air Force. A guide to the evaluation of civilian personnel management activities in the air force. Air Force Manual no. AFM40-5, October 1957.

Department of the Air Force. Instructional system development. Air Force Manual no. 50-2, Washington, D. C.: Department of the Air Force, Headquarters, U. S. Air Force, December 31, 1970.

Department of the Air Force. Course charts, atc regulation 52-6. Randolph AFB, Texas: Headquarters Air Training Command, May 17, 1971.

Department of the Air Force. How to prepare atc training literature. ATC Manual no. 50-6, Randolph AFB, Texas: Air Training Command, August 31, 1971.

Department of the Air Force. Patterns of technical training. ATC Pamphlet no. 52-1, Randolph AFB, Texas: Headquarters Air Training Command, December 20, 1971.

Department of the Air Force. Occupational survey program. ATC Regulation no. 52-22, Randolph AFB, Texas: Headquarters Air Training Command, March 7, 1972.

Department of the Air Force. Student critique program. ATC Regulation no. 52-29, Randolph AFB, Texas: Headquarters Air Training Command, March 7, 1972.

Department of the Air Force. Training materials. ATC Regulation no. 52-18, Randolph AFB, Texas: Headquarters Air Training Command, June 1, 1972.

Department of the Air Force. Instructional system development. ATC no. 52-33, Randolph AFB, Texas: Headquarters Air Training Command, July 3, 1972.

Department of the Air Force. Course training standards. ATC Regulation no. 52-17, Randolph AFB, Texas: Headquarters Air Training Command, August 29, 1972.

Department of the Air Force. Training evaluation and course reviews. ATC Regulation no. 52-1, Randolph AFB, Texas: Headquarters Air Training Command, September 27, 1972.

Department of the Air Force. Plans of instruction. ATC Regulation no. 52-7, Randolph AFB, Texas: Headquarters Air Training Command, October 13, 1972.

Department of the Air Force, the Army, and the Navy. Cost/schedule control systems criteria joint implementation guide. Washington D. C.: the Secretary of Defense, March 1972.

Department of Defense. Opportunities to increase effectiveness of long-term, full-time training program for civilian employees. Report to the Congress, June 1972.

Department of Housing and Urban Development. Small community needs: A study of small community needs as related to federal housing and community development assistance. Washington, D. C., 1971. (ERIC ED 063 987.)

Department of Housing and Urban Development. Local strategies to affect state plan allocation of federal funds. Community Development Evaluation Series, Washington, D. C., 1972, 46 (3).

Department of Labor, Health, Education and Welfare. Opportunities for improving training results and efficiency at the East Bay Skills Center, Oakland, California, under the manpower development act. Report to Congress from Comptroller General of the United States, Washington, D. C., February 10, 1971.

Department of the Navy. Evaluation study of the supply management core development program inventory control option. Philadelphia. (undated)

Department of the Navy. Proceedings of symposium on evaluation of educational technology applications. U. S. Naval Academy, June 22-26, 1970.

Dial, O. E. Notes on the prospects for social indication. A Paper Presented at the Annual Meeting of the American Political Science Association, Los Angeles, California, September 1970.

DiFilippo, P. A. Pilot training for future needs. M-32983-U, D569p, Research Report no. 3596, AUL/LRX, Maxwell AFB, AL 36112, 1968.

Dillman, D. A. & Christenson, J. A. Towards the assessment of public valves. Unpublished manuscript, Pullman, Washington: Washington State University, Department of Sociology, 1971.

Dluhy, M. Housing and social indicators. Unpublished manuscript, Ann Arbor, Michigan: University of Michigan, School of Social Work, 1969.

Dodd, C. S. An analysis of the unit KC-135 flight training process. M-35582-7-U, D639a, Research study no. 0545-71, AUL/LRX, Maxwell AFB, AL 36112

Doty, R. E. A practical look at analysis and selected applications for air force planning. M-35582-7-U, D725p, Thesis no. 0340-68, AUL/LRX, Maxwell AFB, AL 36112, 1968.

Dowling, W. D. A report of the educational component of a coupled on-the-job training program. Columbus, Ohio: Urban League and Ohio State University Center for Adult Education, August, 1970. (ERIC ED 045 878.)

Downes, B. & Friedman, L. A. Local level decision-making and public policy outcomes: A theoretical perspective. In H. Hahn (Ed.), Urban affairs annual review. Vol. 6. People and politics in urban society. Beverly Hills: Sage Publications, 1972.

Draft: joint federal/state task force on evaluation comprehensive evaluation system--current status and development requirements. Washington, D. C.: Scientific Educational Systems, Inc., January, 1970. (ERIC ED 042 817.)

Drescoll, D. L. Missile combat crew morale: Its impact on officer retention. M-35582-7-U, D7812m, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Drewnowski, J. Social and economic factors in development--introductory considerations on their meaning, measurement and interdependence. Report no. 3, Geneva, Switzerland: United Nations Research Institute for Social Development, February, 1966.

Drewnowski, J. Studies in the measurement of levels of living and welfare. Report no. 70.3, Geneva, Switzerland: United Nations Research Institute for Social Development, 1970.

Dubin, R. Causality and social systems analysis. A Paper Presented at the Annual Meeting of the American Sociological Association, Denver, Colorado, August 30--September 2, 1971.

DuBois, P. H. & Mayo, G. D. (Eds.) Research strategies for evaluating training. Washington, D. C.: American Educational Research Association, 1970. (ERIC ED 043 804.)

Duke, E. A case study of management technique. Personnel Journal, 1972, 51 (1), 32-5.

Duncan, D. M. Training strategy and the "system." Personnel Journal, 1972, June, 413-418.

Duncan, O. D. Social stratification and mobility: Problems in the measurement of trend. In E. B. Sheldon & W. E. Moore (Eds.), Indicators of social change: Concepts and measurements. New York: Russell Sage Foundation, 1968.

Eckelkamp, V. C. J. Developing in-flight judgment. M-35582-7-U, E191d, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Eckelkamp, V. C. J. T-3ɔ pilot instructor training. M-35582-7-U, E191t, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Educational Innovators Press. Performance and process objectives. Tucson, Arizona, 1970. (ERIC ED 054 606.)

Educational Research Service. Evaluating administrative/supervisory performance. Washington, D. C., November 1971. (ERIC ED 058 155.)

Eisinger. P. K. People and politics in urban society. In H. Hahn (Ed.), Urban affairs annual review. Vol 6. Beverly Hills: Sage Publication, 1972.

Eitington, J. Film and group = more learners. Training in Business and Industry, 1972, 9 (1), 42-43.

Eliot, B. F. Laterality, reaction-decision time, and pilot training effectiveness. Engineering Report (M. S.), Arizona State University, 1969.

Elmer, D. A. Revival of the air combat maneuvering training program. M-32983-U, E48r, Professional Study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Engel, G. W. An analysis of the initial qualification training program for B-52 aircrews. M-35582-7-U, E571a, Thesis no. 0655-67, AUL/LRX, Maxwell AFB, AL 36112, 1967.

Etzioni, A. Indicators of the capacities for societal guidance. The Annals of the American Academy of Political and Social Science, 1970, 388, 25-34.

Etzioni, A. & Lehman, W. Some dangers in 'valid' social measurement. The Annals of the American Academy of Political and Social Science, 1967, 373, 1-15.

Evans, J. W. Political factors in evaluation--the case of Head Start. Washington, D. C.: U. S. Office of Education, 1971.

Everett, R. P. & Hall, W. Regional training centers: A new venture in management development and intergovernmental cooperation. Sacramento, California: California State Personnel Board, March 1971.

Extension Teaching and Field Service Bureau, Division of Extension. Information sheet. Austin: University of Texas at Austin. (undated)

Farace, R. V. & Russell, H. W. Beyond bureaucracy--message diffusion as a communication audit tool. East Lansing: Michigan State University, April 1972.

Ferriss, A. L. Indicators of trends in the status of American women. New York: Russell Sage Foundation, 1971.

Fiedler, F. E. Predicting the effects of leadership training and experience from the contingency model. Journal of Applied Psychology, 1972, 56 (2), 114-19.

Fincher, C. F. F-111 aircrew training for low altitude operations. M-35582-7-U, F4921f, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Finsterbusch, K. Dimensions of nations: Inductively and deductively developed and propositionally related. A Paper Presented at the Conference on Methodological Problems in Comparative Sociological Research of the Institute for Comparative Sociology, Bloomington, Indiana, April 1971.

Fitzgibbon, T. J. Evaluation in the inner city. Paper Presented at the Invitational Conference on Measurement in Education, Philadelphia, Pennsylvania, April 1969. (ERIC ED 049 269.)

Flanagan, J. C. & Miller, R. B. The performance record, administrator's manual. Chicago: Science Research Associates, 1955.

Flanagan, J. C. & Miller, R. B. The performance record, handbook for foremen and supervisors of hourly employees. Chicago: Science Research Associates, 1955.

Flanagan, J. C. & Miller, R. B. The performance record, handbook for superintendents and general foremen. Chicago: Science Research Associates, 1955.

Flanagan, J. C. & Miller, R. B. The performance record, handbook for supervisors of nonsupervisory salaried employees. Chicago: Science Research Associates, 1955.

Flanagan, J. C. & Miller, R. B. SRA catalog for business. Chicago: Science Research Associates, 1973.

Flaten, E. A. An increasing requirement for the professional military education of our national guard officers. M-32983-U, F5863i, Professional study no. 4040, AUL/LRX, Maxwell AFB, AL 36112, 1970.

Flax, M. J. Future prospects for the development of additional social and urban indicators. Working paper no. 1206-2, Washington, D. C.: The Urban Institute, 1971.

Fleishman, E. A. (Ed.) *Studies in personnel and industrial psychology*. Homewood, Illinois: Dorsey Press, 1961.

Fleishman, E. A. Attitude vs. skill factors in work group productivity. *Personnel Psychology*, 1965, *18*, 253-266.

Fleishman, E. A. On the relation between abilities, learning, and human performance. *American Psychologist*, 1972, *27* (11), 1017-1032.

Flynn, R. R. Electronic warfare officer training. M-35582-7-U, F648e, Research study no. 0675-71, AUL/LRX, Maxwell AFB, AL 36112, 1971.

Folk, M. A critical look at the cross impact matrix method. A Research Report, Washington, D. C.: Syracuse University Research Corp. for the National Center for Educational Research and Development, August 1971. (ERIC ED 061 635.)

Ford, J. B. Contextual content analysis: A link between micro-social and macro-social research. A Paper Presented at the Annual Meeting of the American Sociological Association, Denver, Colorado, August 30--September 2, 1971.

Forsyth, R. A. Considerations to the usefulness of the performance indicators in Dyer's student change model of an educational system. Paper Presented at Annual Meeting of American Educational Research Association, Chicago, April 1972. (ERIC ED 063 332.)

Fortune, J. C. Problems facing the evaluator of social action programs. A Paper Presented at the Symposium on Evaluation Prospectives: A Focus on Current Gaps at the Annual Meeting of the American Educational Research Association, Chicago, April 1972. (ERIC 064 380.)

Fosse, J. M. Technical training--the key to a true volunteer air force. M-35582-7-U, F752t, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Frey, E. P. Spin training: A treatise. M-35582-7-U, F8931s, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Froberg, S. E. A guide for the development of an inservice education program. Tampa: Florida Regional Medical Program, May 1971. (ERIC ED 049 431.)

Fulmer, R. M. The future of training for the future. *Training in Business and Industry*, 1972, February, 40-41.

Gable, S. R. Laboratory training--its role in air force manager development. M-35582-7-U, G1151, Thesis no. 0805-67, AUL/LRX, Maxwell AFB, AL 36112, 1967.

Gagne, R. M. (Ed.) *Psychological principles in system development*. New York: Holt, Rinehart & Winston, 1962.

Gail, J. W. An incentive program for air reserve forces personnel: College tuition assistance, skill knowledge training, and promotion. M-32983-U, 61381, Professional study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Galnoor, I. Social information for what? *The Annals of the American Academy of Political and Social Science*, 1971, *393*, 1-19.

Garn, H. A. & Flax, M. J. Urban Institute indicator program. Working Paper 1206-1, Washington, D. C.: The Urban Institute, July 1971.

Garstka, J. A. A comparative analysis of training reports. M-35582-7-U, G243c, Thesis no. 0820-67, AUL/LRX, Maxwell AFB, AL 36112, 1967.

Gastil, R. D. Social indicators and quality of life. *Public Administration Review*, 1970, *30*, 596-601.

Gentry, J. C. Job related education as a recruitment/retention device in the all volunteer force. M-32983-U, G339j, Professional study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Gerbner, G. Cultural indicators: The case of violence in television drama. *The Annals of the American Academy of Political and Social Science*, 1970, *388*, 69-81.

Germann, D. B. Management decision education for the young officer. M-35582-7-U, G373m, Thesis no. 0840-67, AUL/LRX, Maxwell AFB, AL 36112, 1967.

Giammateo, M. G. Target group analysis: Aids for evaluation. Field Paper 9, Contract OEC-4-7-062871-3054, Portland, Oregon: Northwest Regional Educational Lab, April 1969. (ERIC ED 031 785.)

Giguere, A. Aircrew standardization--an analysis. M-35582-7-U, G4615, Thesis no. 0860-67, AUL/LRX, Maxwell AFB, AL 36112, 1967.

Gilroy, K. A. Electronic warfare training for tactical fighter aircrew (U). M-35582-7-S, G489e, Research study no. 0540-70, AUL/LRX, Maxwell AFB, AL 36112, 1971.

Gitter, A. G. Factor analytical approach to indexing multivariate data. Report no. 43, Boston: Boston University, Communication Research Center, 1970.

Gitter, A. G. & Knoche, E. Importance ratings of sixteen aspects of life. Report no. 59, Boston: Boston University, Communication Research Center, 1971.

Glaser, R. *Training research and education*. Pittsburgh: University of Pittsburgh Press, 1962.

Glaser, R. Instructional technology and the measurement of learning outcomes. *American Psychologist*, 1963, *18* (8), 519-521.

Glaser, R. & Glanzer, M. Abstract of training and training research. Report no. Nonr-2551-00, Pittsburgh: American Institutes for Research, August 1958. (ERIC ED 044 578.)

Glass, G. J. Course design and media selection for training C-141 pilots. M-35582-7-U, G549c, Research study no. 0545-70, AUL/LRX, Maxwell AFB, AL 36112, 1971.

Goetz, C. T. Outline for air force teacher training manual--Protestant. 358.34, A2988s, Student Report no. 9, AUL/LRX, Maxwell AFB, AL 36112, 1968.

Gold, B. K. Evaluation of programs. Paper Presented at a Conference Sponsored by the Compensatory Education Project, Coordinating Board, Texas College and University System, Austin, Texas, April 5-6, 1971. (ERIC ED 048 845.)

Goldwasser, E. L. Science and man: Breaking new ground at Batavia. *Bulletin of the Atomic Scientists*, 1969, *25* (8), 7-10.

Gooler, D. D. Data collection for educational decision-making: Establishing priorities. Report no. WP-No-1, Urbana: Illinois University, Center for Instructional Research and Curriculum Evaluation. (undated) (ERIC ED 046 998.)

Gooler, D. D. & Grotelueschen, A. D. Curriculum development accountability. *The Education Digest*, 1972, January, 21-23.

Gordon, A. C., Campbell, D. T., et al. Recommended accounting procedures for the evaluation of improvements in the delivery of state social services. Preliminary draft, Evanston, Illinois: Northwestern University, Center for Urban Affairs, 1970.

Gordon, T. J. & Ament, R. H. Forecasts of some technological and scientific developments and their societal consequences. Middletown, Connecticut: Riverview Center, Institute for the Future, 1969.

Gottschalk, L. A. & Gleser, G. C. *The measurement of psychological states through the content analysis of verbal behaviors*. Los Angeles: University of California Press, 1969.

Grassman, J. W. Why not an aviation cadet program? M-35582-7-U, G 769w, Research study no. 0560-70, AUL/LRX, Maxwell AFB, AL 36112, 1970.

Gray, K. E. Competencies needed by personnel engaged in program planning in state divisions of vocational-technical education. 1970. (ERIC ED 042 927.)

Greve, J. Voluntary housing in Scandinavia. *Public Administration Journal of the Royal Institute of Public Administration*, London, 1972, *50* (Summer).

Grobman, [illegible] *Developmental curriculum projects: Decision points and processes*. New York: F. E. Peacock, 1970.

Gronlund, N. E. *Stating behavioral objectives for classroom instruction*. New York: The Macmillan Co., 1970.

Gross, B. M. The coming general systems models of social systems. *Human Relations*, 1967, *20* 357-374.

Gross, J. R. The air force officer evaluation program: A comparison of civilian industry and the air force, M-35582-7-U, G878a, Thesis no. 0940-67, AUL/LRX, Maxwell AFB, AL 36112, 1967.

Grove, W. T. Analysis of unit level combat readiness training. M-35583-7-U, G883a, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Gruenfeld, L. Personality needs and expected benefits from a management development program. *Occupational Psychology*, 1966, *40* (1&2), 75.

Guba, E. G. Evaluation as a decision-making tool. Speech Given at Audio-Visual Conference, Indiana University, June 1970. (ERIC ED 055 362.)

Haas, J. A. Middle managers' expectations of the future world of work: Implications for management development. Pittsburgh: Pittsburgh University, 1969. (ERIC ED 041 207.)

Haggard, D. F. et al. An experimental program of instruction on the management of training. Report no. HumRRO-TR-70-9, Alexandria, Virginia: Human Resources Research Organization, June 1970, (ERIC ED 047 195.)

Haggerty, S. K. Military subsidies to the American society. M-32983-U, H1452m, Professional study no. 3921, AUL/LRX, Maxwell AFB, AL 36112, 1970.

Hahn, A. J. Community decision-making systems. November 1970. (ERIC ED 054 406.)

Hamlin, D. A. An analysis of executive development in the U. S. Air Force. M-35582-7-U, H223a, Thesis no. 0475-6[illegible], AUL/LRX, Maxwell AFB, AL 36112, 1968.

Hampton, L. A. An analysis of critical behaviors of cooperative extension agents in the performance of their jobs. Ed.D Thesis, Raleigh: North Carolina State University, 1969. (ERIC ED 042 978.)

Hansen, M. H. et al. Sample survey methods and theory. New York: John Wiley & Sons, 1953.

Harmon, P. Developing performance objectives in job training programs. *Educational Technology*, 1968, November, 11-16.

Harris, E. C. Sensitivity training and managerial development. M-32983-U, H313s, Professional study no. 4042, AUL/LRX, Maxwell AFB, AL 36112, 1970.

Harsanyi, C. A. & White, C. E. An analysis of the effectiveness of the weapons mechanic training program. SLSR-10-67, AFIT/L, Wright-Patterson AFB, OH 45433, 1968.

Hartke, R. H. Effectiveness in cost effectiveness analysis. M-35582-7-U, H329e, Thesis no. 0500-68, AUL/LRX, Maxwell AFB, AL 36112, 1968.

Hatch, J. C. Television performance effectiveness: A study of related variables and the effects of inservice training and evaluative feedback. Ph.D. Thesis, Madison: The University of Wisconsin, 1968. (ERIC ED 045 913.)

Hauser, P. M. The chaotic society: Product of the social morphological revolution. *American Sociological Review*, 1969, *34*, 1-19.

Hauser, P. M. Political implications of social indicators. A Paper Presented at the Annual Meeting of the American Political Science Association, Chicago, September 1971.

Hazel, J. T. Reliability of job ratings as a function of time spent on evaluation. *Journal of Industrial Psychology*, 1966, *4*, 16-19.

Heaphy, J. F. Community relations training: An alternative view. *Journal of Criminal Law, Criminology and Police Science*, 1971, *62* (4), 570-572.

Heller, F. A. & Porter, L. W. Perceptions of managerial needs and skills in two national samples. *Occupational Psychology*, 1966, *40* (122), 1.

Helton, C. T. The need for an expanded reading program. M-35582-7-U, H4841n, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Henriot, P. J. Political questions about social indicators. *The Western Political Science Quarterly*, 1970, *23*, 235-255.

Heyman, M. M. Criteria and guidelines for the evaluation of in-service training. Washington, D. C.: Department of Health, Education, and Welfare, 1968. (ERIC ED 031 643.)

Henrichs, J. R. Evaluation of an industrial training program. *Proceedings of the Annual Convention of the American Psychological Association*, 1972, *7*, 445-446.

Hock, M. D. Considerations of decision theory in the reconstruction of logic in urban planning. Columbus, Ohio: Ohio State University, 1968. (ERIC ED 034 299.)

Hodgkinson, H. L. & Thelin, J. Survey of the applications and uses of unobtrusive measures in fields of social service. Berkeley: University of California, August 1971. (ERIC ED 058 863.)

Hodgson, W. E. Some basic design considerations for army helicopter synthetic flight trainers. M-35582-7-U, H691s, Thesis no. 0550-68, AUL/LRX, Maxwell AFB, AL 36112, 1968.

Holder, J. J. Evaluation of an in-company management training program. *Training and Development Journal*, April 1972.

Holiday, R. C. Automated scheduling and record keeping for ADC ground environment training. M-32983-U, H7321a, Professional study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Hooker, C. P. & Mueller, V. D. A plan for performance review and compensation of administrative personnel. Richfield, Minnesota: Richfield Independent School District 280, May 1969. (ERIC ED 043 094.)

Hoos, I. R. Information systems and public planning. *Management Science*, 1971, *17*, B-658-B-671.

Hopper, T. E. Air force advanced education: A cost-effectiveness approach M-32983-U, H7981a, Professional study no. 3387, AUL/LRX, Maxwell AFB, AL 36112, 1967.

Hormay, A. L. *Principles of rest-rotation grazing and multiple-use land management*. Training test no. 4(2200), Washington, D. C.: Forest Service U. S. Department of Agriculture, September 1970.

Horowitz, I. L. *Professing sociology: Studies in the life cycle of social science*. Chicago: Aldine Publishing Co., 1968.

Horowitz, I. L. Social indicators and social policy. In I. L. Horowitz (Ed.), *Professing sociology: Studies in the life cycle of social science*. Chicago: Aldine Publishing Co., 1968.

Houk, C. P. Formal training requirements for air force maintenance engineering duties. M-35582-7-U, H8383f, Research study no. 0700-70, AUL/LRX, Maxwell AFB, AL 36112, 1971.

Housing in the inner city. *Urban Research News*, 1970, *4* (15), 8.

Hozel, J. T. Reliability of job ratings as a function of time spent on evaluation. *Journal of Industrial Psychology*, 1966, *4*, 16-19.

Huggins, L. E. Modernization of the tactical fighter air-to-ground gunnery range. M-35582-7-U, H8913m, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Hutchinson, T. E. Some overlooked implications of the purpose: To provide data for decision-making. Presented at Annual Meeting of the American Educational Research Association, Chicago, April 1972.

Hyder, C. M. Model cities training program. Evaluation Report, Chattanooga, Tennessee: Tennessee University, 1969. (ERIC ED 043 848.)

The Illinois Department of Local Government Affairs. Intern plan to increase manpower. Local Government News. September-October 1970.

Illinois State Board of Higher Education. Public administration. Report of Master Plan Committee T, Springfield, Illinois, 1969. (ERIC ED 040 650.)

Institut de Recherche Economique et de Planification. Recherche sur l'integration desindicateurs . . . . Unpublished manuscript, Grenoble, France: University of the Social Sciences of Grenoble, 1971.

Institut National de la Statistique et des Etudes Economiques. Inventaire bibliographique. Unpublished manuscript no. 320/1163, Prepared by the Social Statistics Group, Paris, France, 1971.

Institut National de la Statistique et des Etudes Economiques. Presentation des travaux Francais. Unpublished manuscript, Paris France: Comissariat General du Plan d'Equipment et de la Productivite, 1971.

Institut National de la Statistique et des Etudes Economiques. Social Indicators. Unpublished manuscript, Paris, France: Social Statistics Group, 1971.

Institute for Urban Studies. Housing management training curriculum. Houston, Texas: The University of Houston, November 1-13, 1971.

Institute for Urban Studies. Housing management training--seminars and evaluation surveys. Houston, Texas: The University of Houston, November 1-13, 1971.

Institute of Urban and Regional Development. Advice as a socially constructed activity. Working Paper no. 144C, Berkeley, California: University of California, 1971.

Institute of Urban Studies. Executive manpower for urban government. Vol. 2 Education for Career service. Arlington, Texas: The University of Texas at Arlington.

International Association of Chiefs of Police, Professional Standards Division. Police reference notebook, section II (supervision index). 1971.

Jackson, E. N. A factor analysis of small community development. Unpublished Masters Thesis, Manhattan, Kansas: Kansas State University, 1970.

Jaffee, C. L. Effective management selection: Analysis of behavior by simulation techniques. Reading, Massachusetts, 1971. (ERIC ED 058 531.)

Jamieson, G. H. A pilot survey of recruitment and training. *Occupational Psychology*, 1966, *40* (1&2), 167.

Jew, B. More bang for the buck. M-32983-U, J59m, Professional study no. 4041, AUL/LRX, Maxwell AFB, AL 36112, 1970.

Jew, B. Primary cause: Pilot factor. M-32983-U, J59p, Professional study no. 3938, AUL/LRX, Maxwell AFB, AL 36112, 1970.

Johns, J. P. & Glovinsky, A. Paraprofessional training model. A process for training. Contract no. OEG-0-9-324150-2235-725, Detroit, Michigan: Wayne County Intermediate School District, July 1970. (ERIC ED 049 183.)

Johns, J. P. & Glovinsky, A. Taxonomy of paraprofessional training. Contract no. OEG-0-9-324150-2235-725, Detroit, Michigan: Wayne County Intermediate School District, September 1970. (ERIC ED 049 184.)

Johnson, A. L. An analysis of on-the-job proficiency training. M-35582-7-U, J663a, Thesis no. 1210-67, AUL/LRX, Maxwell AFB, AL 36112, 1967.

Johnson, N. J. & Ward, E. J. A new approach to citizen participation: An exploration tying information and utilization. Pittsburgh: Carnegie-Mellon University, School of Urban and Public Affairs, 1970.

Johnsten, R. A. Motivation in missile training. M-35582-7-U, J72m, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Johnston, D. F. Forecasting methods in the social sciences. *Technological Forecasting and Social Change*, 1970, *2*, 173-187.

Jones, W. G. *List of publications: 1966-1970*. Ann Arbor, Michigan: The University of Michigan, Institute for Social Research, February 1971.

Judge, A. J. Information systems and inter-organizational space. *The American Academy of Political and Social Science*, 1971, *393*, 47-64.

Justiss, B. R. The role of the flight simulator in transition training for jet transport pilots. M-35582-7-U, J96r, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Kamrany, N. M. A note on the development of social indicators. Santa Monica, California: Systems Development Corporation, 1968.

Karalus, P. H. An analysis of the USAF pilot training program. M-32983-U, K181a, Professional study no. 4162, AUL/LRX, Maxwell AFB, AL 36112.

Katagiri, G. Oregon's pilot state dissemination program. Oregon State Board of Control, Contract no. OEC-0-70-4755, Washington, D. C.: National Center for Educational Communication, January 1972.

Kaufman, R. A. _Educational system planning_. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1972.

Kaufman, R. A., Corrigan, R. E., & Nummelly, C. L. The instructional system approach to training. _Human Factors_, 1966, _9_ (2), 157-162.

Kavanagh, M. J., MacKinney, A. C., & Wolins, L. Issues in managerial performance: Multitrait--multimethod analyses of ratings. _Psychological Bulletin_, 1970, _75_ (1), 34-49.

Kellam, S. G., Agrawal, K. C., Branch, J. D., & Grabill, M. E. Strategies in urban community mental health. Chicago: The University of Chicago, Woodlawn Mental Health Center, 1972.

Kelly, E. F. & Bunda, M. A. The development of a survey instrument for evaluative priorities: A field test. Paper Presented at the Annual Meeting of the American Educational Research Association, New York, February 1971. (ERIC ED 049 317.)

Kepner, C. H. & Tregoe, B. B. _The rational manager_. New York: McGraw-Hill, 1965.

Kind, S. M. Gedrag van de consulent nader bekeken. [Activity of the outside expert reviewed more closely]. _Mens en Onderneming_, 1969, _23_ (1), 27-37.

Kipnis, D. & Glickman, A. S. The prediction of job performance. _Journal of Applied Psychology_, 1962, _46_, 50-56.

Kirkpatrick, D. L. Supervisory training and development. Madison, Wisconsin: American Society for Training and Development, 1971. (ERIC ED 054 450.)

Kish, L. Survey sampling. New York: John Wiley & Sons, 1967.

Kitchell, D. Training USAF MAAG advisor personnel. M-35582-7-U, K621t, Research study no. 1120-71, AUL/LRX, Maxwell AFB, AL 36112.

Kline, R. W. Classroom leadership in professional military education. M-35582-7-U, K653c, Thesis no. 0673-68, AUL/LRX, Maxwell AFB, AL 36112, 1968.

Kohn, V. A selected bibliography of evaluation of management training and development programs. Hamilton, New York: American Foundation for Management Research, Inc., 1969. (ERIC ED 034 947.)

Kohn, V. & Parker, T. C. Some guidelines for evaluating management development seminars. Training and Development Journal, 1969, 23, 19-25.

Kondrasuk, J. N. Selling: The name of the game in training. Training and Development Journal, 1972, 26 (6), 14-17.

Konuitz, M. R. Civil liberties. The Annals of the American Academy of Political and Social Science, 1967, 371, 38-58.

Krathwohl, D. R., Bloom, B. S., & Masio, B. B. Taxonomy of educational objectives: Affective domain. New York: David McKay Co., Inc., 1964.

Krendel, E. S. The life cycle as a basis for social policy and social indicators. Working paper no. 106, Berkeley, California: University of California, Institute of Urban and Regional Development, 1969.

Krendel, E. S. A case study of citizen complaints as social indicators. IEEE Transactions on Systems Science and Cybernetics, 1970, SSC-6 (4), 265-272.

Krendel, E. S. Social indicators and urban systems dynamics. Socio-Economic Planning Sciences, 1971, 5 (4), 387-393.

Krieger, M. H. Planning an affect based society: Prediction, indicators and structure. Working paper 144B, Berkeley, California: University of California, Institute of Urban and Regional Development.

Kuhlman, A. J. An analysis of the feasibility of consolidating radar training and maintenance on the F/FR-4C/D aircraft. SLSR-50-71B, AFIT/L, Wright-Patterson AFB, OH 45433, 1972.

Lamale, H. H. Changes in concepts of income adequacy over the last century. *The American Economic Review*, 1958, *47*, 291-299.

Lamson, R. W. Framework of categories for science policy analysis and technology assessment. Washington, D. C.: National Science Foundation, Office of Planning and Policy Studies, 1969.

Land, K. C. Social indicators. In R. B. Smith (Ed.), *Social science methods*. New York: The Free Press, 1970.

Land, K. C. On the definition of social indicators. *The American Sociologist*, 1971, *6*, 322-325.

Lanier, S. L. & Swarts, R. F. Analysis of the management education requirements for the base level chief of aircraft maintenance. SLSR-9-69, AFIT/L, Wright-Patterson AFB, OH 45433, 1970.

Larche, L. E. An analysis of team teaching in secular and religious education. M-35582-7-U, L319a, Thesis no. 1375-67, AUL/LRX, Maxwell AFB, AL 36112, 1967.

Layne, E. C. An analysis of disabling injuries incurred in military airborne training. M. S. Thesis, Georgia Institute of Technology, 1966.

Leadership Resources, Inc. HUD/HAA training program. Washington, D. C., December 1968.

Leadership Resources, Inc. Training outline and guide on: Professional management in public housing. Washington, D. C., November 1970.

Leadley, S. M. Working papers on rural community services. Washington, D. C.: Department of Agriculture, 1972. (ERIC ED 062 064.)

Lehman, E. W. Social indicators and social problems. In E. O. Smigel (Ed.), *Handbook on the study of social problems*. Chicago: Rand McNally & Co., 1971.

Lester, R. I. Criteria for evaluating training materials. *Training and Development Journal*, 1971, *25* (8), 12-15.

Levin, G. & Stein, D. D. System intervention in a school-community conflict. Journal of Applied Behavioral Science, 1970, 6 (3), 337-352.

Levine, R. A. & Williams, A. P. Making evaluation effective: A guide. Pittsburgh: Carnegie Mellon University, May 1971. (ERIC ED 058 612.)

Line, R. N. & Gordon, W. B. A budget manual for Texas cities and towns. Fort Worth, Texas, 1971.

Lineberry, R. L. & Fowler, E. P. Reformism and public policies in American cities. American Political Science Review, 1967, 61 (3), 701-716.

Linowes, D. Accounting for social progress; Yardsticks must be found for public programs. (Extension of remarks of the Hon. F. E. Moss) Congressional Record, 1970, March, E2369-E2370.

Liv, W. T. & Duff, R. W. The structural effect of communication flows in a pre-industrial city. A Paper Presented at the Annual Meeting of the Ohio Valley Sociological Society, Cleveland, Ohio, April 1971.

Lloyd, E. A. Consolidated undergraduate flying training. M-32983-U, L793c, Professional study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Long, N. E. Indicators of change in political institutions. The Annals of the American Academy of Political and Social Science, 1970, 388, 35-45.

Lord, T. F. A report on a feasibility determination. Houston: Institute for Urban Studies, University of Houston, October 1971.

Loupe, M. J. Training and transfer of problem-solving. Minneapolis: Minnesota University, April 1972. (ERIC ED 061 547.)

Low-income housing study. Urban Research News, 1970, 4 (26).

Lowe, H., Adrian, R. & Brocklesly, I. A factor analytic study of selection decision-making. Occupational Psychology, 1968, 42 (1).

Luhrsen, D. E. An investigation of the benefits of certain air force training and research projects of the civilian economy and community. M-35582-7-U, L951i, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Lund, M. A guide to training of office supervisors. London: British Association for Commercial and Industrial Education, November 1969. (ERIC ED 042 964.)

Lundgren, D. C. Trainer style and patterns of group development. The Journal of Applied Behavioral Science, 1971, 7 (6), 689-709.

Lupes, E. C. Correction of correlation with a dichotomus variable for restriction in range. Technical Report PRL-TDR-62-64, Lackland AFB, Texas: 6570th Personnel Research Lab, Aerospace Medical Div., Air Force Systems Command, December 1962.

Luty, E. T. & Metos, T. H. Management through administrative differentiation: An operational strategy utilizing environmental inputs for viable action outputs. 1971. (ERIC ED 057 431.)

MacArgel, R. E. An approach to laboratory training in squadron officer school. M-35582-7-U, M1151a, Thesis no. 0733-68, AUL/LRX, Maxwell AFB, AL 36112, 1968.

Madden, J. M. The effect of varying the degree of rater familiarity in job evaluation. Personnel Administration, 1962, 25 (6), 42-46.

Madden, J. M. A further note on the familiarity effect in job evaluation. Personnel Administration, 1963, 26 (6), 52-53.

Madden, J. P. Social change and public policy in rural America: Data and research needs for the 1970's. American Journal of Agricultural Economics, 1970, 52, 308-314.

Mager, R. F. Preparing instructional objectives. San Francisco: Fearon Publishers, 1962.

Mahoney, T. A., Sorenson, W. W., Jerdee, T. H., & Nash, A. N. Identification and prediction of managerial effectiveness. Personnel Administration, 1963, 26, 12-22.

Maier, N. R. Innovation in education. American Psychologist, 1971, 26 (8), 722-725.

Maier, N. R. Effects of training on decision-making. Psychological Reports, 1972, 30 (1), 159-164.

Maimon, Z. Second-order consequences--a presentation of a concept. Detroit: Center for Urban Studies, Wayne State University, 1971.

Main, E. D. A nationwide evaluation of M. D. T. A. institutional job training programs. Chicago: National Opinion Research Center, University of Chicago, October 1966.

Main, E. D. A nationwide evaluation of M. D. T. A. institutional job training. Journal of Human Resources, 1968, 2 (2).

Malkemes, K. O. Air force aero clubs--a recreational liability? M-35582-7-U, M251a, Thesis no. 1500-67, AUL/LRX, Maxwell AFB, AL 36112, 1967.

Manpower Administration (DOL). Toward the ideal journeyman. Vol. 1, An optimum training system in apprenticeable occupations. Manpower Research Monograph no. 20, Washington, D. C., 1970. (ERIC ED 047 112.)

Mansfield, W. B. Job-related activities of first-line supervisors in Texas manufacturing industries. An Abstract of a Doctoral Dissertation Prepared by Author for Engineering Extension Service, Texas A and M University, Supervisory Development Division, 1970.

Marcuse, P. Social indicators and housing policy. Urban Affairs Quarterly, 1971, 7 (December), 193-217.

Margolis, F. H. Training by objectives: A participant-oriented approach. Washington, D. C.: Sterling Institute, June 1970. (ERIC ED 047 234.)

Market Dynamics, Inc. The public's attitude toward public library services in Essex County, New Jersey. A Research Study Conducted for the Essex County Library Directors Group Public Relations Committee, Trenton: New Jersey State Library, June 1969. (ERIC ED 061 974.)

Markley, O. W. Alternative futures: Contexts in which social indicators must work. Research note. Report no. EPRC-6747-11, Menlo Park, California: Stanford Research Institute, Educational Policy Center, February 1971. (ERIC ED 049 150.)

Marks, D. M. Air attache: Realistic selection and meaningful training. M-32983-C, M3461a, Research Report no. 3641, AUL/LRX, Maxwell AFB, AL 36112, 1968.

Marsh, P. Fightergator--does he come prepared? M-35582-7-U, M366f, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Martin, M. E. The current population survey as a statistical information system. Washington, D. C.: U. S. Office of Management and Budget, 1971.

Martin, T. & Berry, K. J. Generalizing to individuals: Another problem of evidence and inference. A Paper Presented at the Annual Meeting of the Rural Sociological Association, Denver, Colorado, August 1971.

Martinson, D. J. The selection criteria for air force ROTC instructors. M-35582-7-U, M3861s, Research study, AUL/LRX, Maxwell AFB, AL 36112.

Maslow, A. P. Job factors, attitudes and preferences affecting the relative advancement and turnover of men and women in federal careers. Washington, D. C.: American Psychological Association, September 1970. (ERIC ED 043 045.)

Maxwell, H. L. Analysis of AFROTC and SOS curriculums. M-35582-7-U, M4652a, Thesis no. 1540-67, AUL/LRX, Maxwell AFB, AL 36112, 1967.

McClure, E. E. & Groetz, R. E. Graduate curriculum development for social planning specialization in urban and regional planning. Final report, Contract no. OEG-2-7-070008-2958, Tallahassee, Florida: Florida State University, October 1968. (ERIC ED 026 981.)

McConnell, J. J. An assessment center program for multi-organizational use. Training and Development Journal, 1972, March, 6-14.

McDevitt, M. & McGowan, T. New York State's central social environment study: Social research for comprehensive planning. Albany, New New York: New York State Office of Planning Coordination, 1970.

McDonald, J. M. The adequacy of army management training. M-35582-7-U, M1355a, Thesis no. 0800-68, AUL/LRX, Maxwell AFB, AL 36112, 1968.

McGranahan, D. V. Analysis of socio-economic development through a system of indicators. Annals of the American Academy of Political and Social Science, 1971, 393, 65-81.

McGranahan, D. Development indicators and development models. The Journal of Development Studies, 1972.

McGuire, T. A. Cost analysis what is it and what should it be? M-35582-7-U, M1484c, Research study no. 0935-70, AUL/LRX, Maxwell AFB, AL 36112, 1970.

McHale, J. Global ecology: Toward the planetary society. *The American Behavioral Scientist*, 1968, *11*, 29-33.

McIntosh, W. A. Social indicators and social change: An interpretive essay. Unpublished paper, Ames, Iowa: Iowa State University, Department of Sociology, 1971.

McNulty, N. G. Training managers: The international guide. Scranton, Pennsylvania: Harper & Row, 1969. (ERIC ED 043 837.)

McRuer, D. T., Graham, F., & Krendel, E. S. Manual control of single loop systems: Part 1 and part 2. *Journal of Franklin Institute*, 1967, *283* (1 & 2).

Mee, J. F. Changing concepts of management. *S. A. M. Advanced Management Journal*, 1972, *37* (4), 22-35.

Melton, A. Undergraduate pilot training in the USAF. M-32983-U, M588u, Professional study no. 3963, AUL/LRX, Maxwell AFB, AL 36112, 1970.

Merriam, I. C. Concepts and measures of welfare. *Proceedings of the Social Statistics Section of the American Statistical Association*, Washington, D. C., 1967.

Merwin, J. C. Evaluation designs and instruments. Paper Presented at the Symposium, The world of Evaluation Needs Re-Shaping, at the Annual Meeting of the American Educational Research Association, February 1969. (ERIC ED 043 680.)

Meyer, H. H. The validity of the in-basket test as a measure of managerial performance. *Personnel Psychology*, 1970, *23* (3), 297-307.

Meyer, H. H. & Walker, W. B. A study of factors relating to the effectiveness of a performance appraisal program. *Personnel Psychology*, 1961, *14*, 291-298.

Michener, C. W. & Walzer, H. Developing community mental health volunteer system. *Social Work*, 1970, *15* (4), 60-67.

Miller, D. M. Why aerial combat tactics training in aerospace defense command (U). M-32983-S, M64791w, Professional study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Miller, D. R. et al. A manager's guide to objectives. Revised edition, Burlingame, California: Operation PEP, October 1969. (ERIC ED 043 135.)

Miller, J. T. An analysis of aircrew personnel flying out-country interdiction missions. M-32983-TS, M6484a, Research Report no. 3651, AUL/LRX, Maxwell AFB, AL 36112, 1968.

Miller, R. K. MAC navigator managers--can the system be improved? M-35582-7-U, M6494m, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Miller, R. M. Close air support: Let's optimize the pilots. M-35582-7-U, M6493c, Research study no. 1335-71, AUL/LRX, Maxwell AFB, AL 36112.

Miller, S. M. & Bryce, H. J. The promotion of social mobility. *Transactions of the Sixth World Congress of Sociology*, 1966, *4*, 333-344.

Mitchell, J. M. & Mitchell, W. C. The changing politics of American life. In E. B. Sheldon & W. Moore (Eds.), *Indicators of social change: Concepts and measurements*. New York: Russell Sage Foundation, 1968.

Mitroff, I. I. & Betz, F. Dialectical decision theory: A meta-theory of decision-making. *Management Science*, 1972, *19* (1), 11-24.

Mobley, B. M. An analysis of student elimination in the military assistance conventional plot. M-35582-7-U, M6872a, Thesis no. 1725-67, AUL/LRX, Maxwell AFB, Al 36112, 1967.

Model cities training program. Chattanooga, Tennessee: Tennessee University, 1969. (ERIC ED 043 847.)

Moffie, D. J., Calhoon, R., & O'Brien, J. K. Evaluation of a management development program. *Personnel Psychology*, 1964, *17*, 431-440.

Moles, A. The future oriented society: Axioms and methodology. *Futures* *2*, 1970, January, 312-316.

Moore, W. E. & Sheldon, E. B. Monitoring social change: A conceptual and programmatic statement. *Proceedings of the Social Statistics Section, American Statistical Association*, Washington, D. C., 1965.

Morgan, J. N. & Smith, J. D. Measures of economic well-offness and their correlates. *The American Economic Review*, Proceedings and Papers, 1970, *59*, 450-462.

Morsh, J. E. Identification of job types in the personnel career field. Technical Report no. PRL-TR-65-9, Project 7734, Task 773401, Lackland AFB, Texas: Personnel Research Laboratory, Aerospace Medical Division, Air Force Systems Command, April 1965.

Morsh, J. E. & Archer, W. B. Procedural guide for conducting occupational surveys in the United States Air Force. Technical Report no. PRL-TR-67-11, Lackland AFB, Texas: Personnel Research Laboratory Aerospace Medical Division, Air Force Systems Command, September 1967.

Morsh, J. E. & Christal, R. E. Impact of the computer on job analysis in the United States Air Force. *American Psychologist*, 1966, *21*, 676-677.

Morton, J. A. *Organizing for innovation: A systems approach to technical management*. L. C. #T175.M66, New York: McGraw-Hill, 1971.

Moser, C. A. Some general developments in social statistics. In M. Nissel (Ed.), *Social trends*. London: Her Majesty's Central Statistical Office, 1970.

Moss, M. Consumption: A report on contemporary issues. In E. B. Sheldon & W. Moore (Eds.), *Indicators of social change: Concepts and measurements*. New York: Russell Sage Foundation, 1968.

Motes, W. C. Rural development: Economic criteria for assessment of outcome and for research inputs. A Paper Presented at the Annual Meeting of the Rural Sociological Society, Denver, Colorado, August 1971.

Mountcastle, R. C. The FB-111A navigator: training a new co-pilot. M-35582-7-U, M928f, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Moyer, L. N., Kaplan, S. J., & Klein, I. A. Model cities: A design for evaluation. *Social Science*, 1970, *45* (2), 84-92.

Mozzo, M. A. & Martinez, C. An approach to the determination of the educational and training requirements for USAF logistics staff officers. SLSR-23-69, AUL/LRX, Maxwell AFB, AL 36112, 1971.

Mukherji, P. N. A study in induced social change: An Indian experiment. Human Organization, 1970, 29 (3), 169-177.

Mullen, D. J. (Ed.) Accountability. Athens, Georgia: Georgia University, Bureau of Educational Studies and Field Services, 1971. (ERIC ED 057 507.)

Murphy, J. R. Is it Skinner or nothing? Training and Development Journal, 1972, 26 (2), 2-8.

Murphy, K. R. Contrasts in spending by urban families. BLS Report no. 238-8, Monthly Labor Review, 1964, 87, 1249-1253.

Murray, P. T. Tactical fighter training for the counterair mission. M-32983-U, M983t, Professional study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Muse, W. R. Identification and development of tomorrow's managers. Personnel Psychology, 1972, 51 (1), 46-91.

Myers, J. T. An analysis of zero defects. M-35582-7-U, M9963a, Thesis no. 1825-67, AUL/LRX, Maxwell AFB, AL 36112, 1967.

Nagel, D. M. The combat potential index, an improved combat effectiveness measure that allows attack aircraft to be included in ground battle war games. M-32983-U, N147c, Professional study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

NAHRO. Announcement of NAHRO management specialist training program. Journal of Housing, 1971, 28, 163.

NAHRO. Announcement of NAHRO's 1972 series of training and educational programs. Journal of Housing, 1971, 28, 594.

NAHRO's housing management specialist program moves into second year. Journal of Housing, 1972, 1, 27-30.

National Communicable Disease Center of the Health Services and Mental Health Administration, Public Health Service, U. S. Department of Health, Education and Welfare. Training methodology: Part I: Background theory and research: An annotated bibliography. Washington, D. C.: U S. GPO, 1969.

National Wildlife Federation. 1971 EQ index. 1971 National Wildlife, Washington, D. C., 1971.

Neale, J. G. Adult training: The use of programmed instruction. Occupational Psychology, 1968, 42 (4), 23.

Nelson, C. C. An analysis of the workload imposed upon an instructor supervisor in the Air Training Command's technical training centers. M-35582-7-U, N425a, Research study no. 1430-71, AUL/LRX, Maxwell AFB, AL 36112.

Nicholson, E. W. The performance of principals in the accountability syndrome. Paper Presented at National Association of Secondary Principals Annual Convention, March 1972. (ERIC ED 063 626.)

The Non-Profit Housing Center, Inc. Low and moderate income housing production and management. Vol. II. Washington, D. C., July 1972.

Norman, W. T. Validation of personality tests as measures of trait-rating factors. Technical Documentary Report PRL-TDR-62-4, Project 7717, Task 771706, Lackland AFB, Texas: 6570th Personnel Research Laboratory, Aerospace Medical Division, Air Force Systems Command, April 1962.

North Carolina Department of Local Affairs. Training interaction. January 1970.

Northwestern University, Traffic Institute. Staff and command conference. A Course Packet, Chicago: Northwestern University, 1968.

Northwestern University, Traffic Institute. Administration of police training. A Course Packet, Chicago: Northwestern University, 1971.

Nugent, J. A. Methods to reduce cost and increase efficiency in UPT. M-35582-7-U, N967m, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Occupational Survey Branch. United States Air Force job inventory: Helicopter maintenance career ladder. AFPT-90-431-087, Lackland AFB, Texas, December 1, 1972.

Occupational Survey Branch. United States Air Force job inventory: Safety specialist/technician career ladder. AFPT 90-241-099, Lackland AFB, Texas, December 1, 1972.

Occupational Survey Branch. United States Air Force job inventory: Cook and diet therapy career ladders. AFPT 90-622-114, Lackland AFB, Texas, December 15, 1972.

Occupational Survey Branch. United States Air Force job inventory: Defensive fire control systems career ladder. AFPT 90-323-103, Lackland AFB, Texas, January 1, 1973.

Occupational Survey Branch. United States Air Force job inventory: Maintenance analysis specialist/technician career ladder. AFPT 90-391-104, Lackland AFB, Texas, February 1, 1973.

O'Connor, R. L. The future training role in the reserve structure. M-35582-7-U, 0184f, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Odiorne, G. S. Training by objectives: An economic approach to management training. New York: The Macmillan Co., 1970. (ERIC ED 047 233.)

Office of Economic Opportunity. Improvements needed in training and technical assistance services provided to anti-poverty agencies. B-130515, Washington, D. C., April 1972.

Office of the Governor, Division of Planning Coordination. Goals for Texas, phase one. Austin, Texas, September 1969.

Office of the Governor, Division of Planning Coordination. Goals for Texas, phase two. Austin, Texas, September 1970.

Office of the Governor, Division of State-Local Relations. Community improvement guide. Austin, Texas. (undated)

Office of the Governor, Division of State-Local Relations. Texas communities tomorrow. Austin, Texas, October 1969.

Office of the Governor, Division of State-Local Relations. Texas communities tomorrow. First Annual Report, Austin, Texas, November 1970.

Office of the Governor of Texas and Texas Department of Community Affairs. Texas housing report. Austin, Texas, January 1972.

Office of Planning Coordination. *Central New York regional economic study; phase 1: Basic inventories and analysis*. Albany, New York, 1968.

Ogburn, W. F. *Social effects of aviation*. Cambridge, Massachusetts: Houghton Mifflin, 1946.

Olson, M. Social indicators and social accounts. *Socio-Economic Planning Science*, 1969, *2*, 335-346.

Olson, M. Social indicators for less developed countries. Draft, Ta/PM/M, Washington, D. C.: Agency for International Development, August 1971.

Ontell, R. What is a social indicator? Unpublished manuscript, San Diego, California: Urban Observatory, 1971.

Oregon State Civil Service Commission. Training in Oregon state government. A Report to the Governor and the 55th Legislative Assembly, Salem, Oregon, July 1968.

Orientation and Training Branch, Division of Field Operations, Bureau of Hearings and Appeals. Letterwriting workshops, an evaluation study. Washington, D. C.: Department of Health, Education, and Welfare, April 1968.

Osborn, W. C. & Goodman, B. E. A tentative organizational schema for decision-making problems. Alexandria, Virginia: George Washington University, Human Resources Research Office, July 1966. (ERIC ED 061 588.)

Ostrom, E. On the meaning and measurement of output and efficiency and the production of urban police services. Unpublished manuscript, Bloomington, Indiana: Indiana University, Department of Political Science, 1971.

Ostrominski, J. Initiatives for reducing personnel and maintenance costs with job performance aids. M-32983-U, 0851i, Professional study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Ostrominski, J. Job performance aids: Acceptance begins with understanding. M-32983-U, 0851j, Professional study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Othling, W. L. Critique of war gaming, computer simulation, and game theory as tools in the study of military conflict situations. M-35582-7-U, 087c, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Otto, C. P. & Glaser, R. O. *The management of training: A handbook for training and development personnel.* Reading, Massachusetts: Addison-Wesley Publishing Co., 1970.

Overfelt, C. D. Professional military education and the USAF medical service. M-32983-U, 0962p, Professional study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Palley, H. A. & Palley, M. L. Social policy analysis---the use of social indicators. *Welfare in Review*, 1971, *9*, 8-14.

Papaloizos, A. & Stiefel, R. The effectiveness of management teaching methods. *Management Decision*, 1971, *9* (Summer), 111-121.

Parkhurst, N. P. A study to examine the need for improving air force pilot utilization policies, develop alternatives that enhance pilot procurement and retention while minimizing training costs. M-35582-7-U, P246s, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Parr, R. S. Improved effectiveness for air combat maneuvering training: A case study. M-32983-S, P259Li, Professional study no. 3471, AUL/LRX, Maxwell AFB, AL 36112, 1967.

Passett, B. A. Leadership development for public service. Houston, Texas: Gulf Publishing Co., 1971. (ERIC ED 056 265.)

Peach, L. Personnel management--art or science? *Personnel Journal*, 1972, *4* (2), 26-29.

Pearl, A. New careers and model cities. Bethesda, Maryland: ERIC Document Reproduction Service, January 1968. (ERIC ED 039 453.)

Pena, W. M. & Focke, J. W. Problem seeking. New directions in architectural programming. Houston, Texas: Caudell, Rowlett & Scott, 1969. (ERIC ED 037 930.)

Perle, E. D. Notes on urban information systems and urban indicators. A Paper Presented at the Annual Meeting of the Association for Computing Machinery, New York, September 1970.

Perle, E. D. Local societal indicators. A Progress Report. *Proceedings of the Social Statistics Section, American Statistical Association*, Washington, D. C., 1971.

Petersen, P. B. Leadership training. *Training and Development Journal*, 1972, April, 38-42.

Pfaff, A. B. An index of consumer satisfaction. A Paper Presented at the Annual Meeting of the American Economic Association Jointly with the Association for the Study of the Grants Economy, New Orleans, Louisiana, December 1971.

Piele, P. K. New programs for training school administrators. Analysis of literature and selected bibliography. Analysis and Bibliography Series no. 10, Eugene, Oregon: Oregon University, ERIC Clearinghouse on Educational Administration, September 1970. (ERIC ED 043 119.)

Pitts, G. & Holmes, R. T. The total cost approach to cost effectiveness. SLSR-3-69, AFIT/L, Wright-Patterson AFB, OH 45433, 1970.

Pittsburgh University, University Urban Interface Program. The impact of the University of Pittsburgh on local economy. DHEW #BR-8-0725, Washington, D. C., April 1972. (ERIC ED 063 901.)

Place, H. C. Undergraduate pilot training: A new approach to an old program. M-35582-7-U, P697a, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Popham, W. J. (Ed.) *Criterion-referenced measurement: An introduction*. Englewood Cliffs, New Jersey: Educational Technology Publications, 1971.

Porter, K. W. *Managerial attitudes and performance*. Homewood, Illinois: Irwin, 1968.

Potter, R. G., Jain, A. K., & McCann, B. Net delay of next conception by contraception: A highly simplified case. *Population Studies*, 1970, *24* (2), 173-192.

Powell, E. Do your own thing. M-82983-U, P8821d, Professional study no. 3983, AUL/LRX, Maxwell AFB, AL 36112, 1970.

Powers, J. G. The air force pilot's exodus to the airlines---still a problem in the 1970's? M-35582-7-U, P8882a, Thesis no. 2045-67, AUL/LRX, Maxwell AFB, AL 36112, 1967.

Prather, R. L. Job profile, perfomance evaluation, and career progress. *Personnel Journal*, 1969, *48* (7), 513-522.

Prien, E. P. & Kult, M. Analysis of performance criteria and comparison of *a priori* and empirically derived keys for a forced choice scoring. *Personnel Psychology*, 1968, *21*, 505-513.

Prien, E. P., Barrett, G., & Sretlik, B. Use of questionnaires in job evaluation. *Journal of Industrial Psychology*, 1965, *3*, 91-94.

Pucel, D. J. et al. The ability of standardized test instruments to predict training success and employment success. Project Mini-Score, Final Technical Report, Minneapolis: Minnesota University, March 1972.

Quimby, R. F. Can all air force officers really be counselors? M-35582-7-U, Q63c, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Quisenberry, J. D. An analysis of ANG technical training. M-35582-7-U, Q8a, Research study no. 1110-70, AUL/LRX, Maxwell AFB, AL 36112, 1970.

Rapp, M. The analytical aspects of evaluating on-going programs. Paper Presented at American Educational Research Association Annual Meeting, Chicago, 1972.

Rappaport, C. A framework for evaluating the impact of the model cities program. A Paper Presented at the National Meeting of the Operations Research Society of America, Detroit, October 1966.

Ratajczak, R. Problems in the evaluation of poverty programs. Santa Monica, California: Systems Development Corporation, 1969.

Raymond, R. S. & Richards, E. Social indicators and business decisions. *Michigan State University Business Topics*, 1971, Autumn, 42-46.

Record, J. F. An analysis: The training role of the United States Air Force instrument pilot instructor school. M-35582-7-U, R311a, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Reichart, R. D. Fighter aircrew preparation for Southeast Asia. M-35582-7-U, R348f, Thesis no. 1015-68, AUL/LRX, Maxwell AFB, AL 36112, 1968.

Repput, J. W. C-141 combat airlift navigator training in the military airlift command. M-35582-7-U, R425c, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Rhinehart, J. B. et al. Comparative study of need satisfactions in governmental and business hierarchies. *Journal of Applied Psychology*, 1969, *53*, 3 (part 1), 230-235.

Riccobono, J. A. & Cunningham, J. W. Work dimensions derived through systematic job analysis: A study of the occupation analysis inventory. North Carolina State University, National Center for Educational Research and Development, 1971. (ERIC ED 062 541.)

Rice, E. T. An exploratory study to investigate the aspects of the construction and use of instruments encompassing the evaluative strategies of context, input, process, and product of in-service programs. Iowa City: Iowa University, Center for Research in School Administration, April 1969. (ERIC ED 043 681.)

Richard, R. Subjective social indicators. Chicago: National Opinion Research Center, University of Chicago, 1969.

Ridley, C. E. & Herbert, S. Measuring municipal activities: A survey of suggested criteria and reporting forms for appraising administration. Chicago: The International City Managers' Association, 1938.

Rindahl, G. F. Using programmed learning to improve power plant reliability. M-35582-7-U, R579u, Thesis no. 2120-67, 1967.

Rivlin, A. M. *Systematic thinking for social action*. Washington, D. C.: Brookings Institution, 1971. (ERIC ED 057 140.)

Roberts, E. E. Increased leadership effectiveness. M-32983-U, R643i, Research Report no. 3672, AUL/LRX, Maxwell AFB, AL 36112, 1968.

Rokeach, M. & Parker, S. Values as social indicators of poverty and race relations in America. *The Annals of the American Academy of Political and Social Science*, 1970, *388*, 97-111.

Ronan, W. W. A factor analysis of II job performance measures. *Personnel Psychology*, 1963, *16*, 255-267.

Ronan, W. W. Evaluation of skilled trades performance predictors. *Educational and Psychological Measurement*, 1964, *24*, 601-608.

Ronan, W. W. Evaluation of three criterial management performance. *Journal of Industrial Psychology*, 1970, *5* (1), 19-29.

Rosenthal, R. A. & Weiss, R. S. Problems of organizational feedback processes. In R. A. Bauer (Ed.), *Social indicators*. Cambridge, Massachusetts: Institute of Technology Press, 1969.

Rossi, P. H. Community social indicators. DHEW, #BR-6-1610, Baltimore, Maryland: Johns Hopkins University, Center for the Study of Social Organization of Schools, October 1970. (ERIC ED 043 090.)

Ruckelshaus, W. D. From awareness to action. Paper Presented at the Second Earth Day Celebration, Ohio State University, Columbus, April 22, 1971. (ERIC ED 052 980.)

Russett, B. M. Indicators for America's linkages with the changing world. *The Annals of the American Academy of Political and Social Science*, 1970, *388*, 82-96.

Russett, B. M. & Meyer, R. B. *World handbook of political and social indicators*. New Haven: Yale University Press, 1964.

Safka, H. I. The city as a social system: Implications for planning and urban policy. Editor's introduction. *American Behavioral Scientist*, 1972, *15* (4), 483-493.

Sagadencky, E. Staff management. In *Planning 1966*. Chicago: American Society of Planning Officials, 1966.

Sametz, A. W. Production of goods and services: The measurement of economic growth. In E. B. Sheldon & W. E. Moore (Eds.), *Indicators of social change*: Concepts and measurements. New York: Russell Sage Foundation, 1968.

Sanders, J. H. A special training project for evaluators. Final report, Lincoln Public Schools, Nebraska, August 1969. (ERIC ED 047 422.)

Sandhu, H. S. & Allen, D. E. The prison guard: Job perceptions and in-service training in India. *Indian Journal of Social Work*, 1971, *32* (2), 115-120.

Sandler, D. T. An analysis of educational technology and pre-commissioning training at officer training school, USAF. M-35582-7-U, S2171a, Thesis no. 1050-68, AUL/LRX, Maxwell AFB, AL 36112, 1968.

Sardy, S. & Sardy, H. Administrating decision-making and resource allocation. Paper Presented at the American Educational Research Association Annual Meeting, New York, February 1971. (ERIC ED 048 629.)

Sawchuck, R. & Gitter, A. G. Eight subjective indicators of quality of life. Report no. 51, Boston: Boston University, Communication Research Center, 1971.

Sax, R. M. The planning process for social and physical and the need for an environmental design. Monograph no. 2, Pleasant Hill, California: Contra Costa County Department of Education, November 1965. (ERIC ED 028 614.)

Scammon, R. M. Electoral participation. *The Annals of the American Academy of Political and Social Science*, 1967, *371*, 59-71.

Scarboro, G. L. An analysis of the drug education programs in the USAF pre-commissioning and professional military educational schools. M-35582-7-U, S2851a, Research study no. 1695-71, AUL/LRX, Maxwell AFB, AL 36112.

Schick, A. From analysis to evaluation. *Annals of the American Academy of Political and Social Science*, 1971, *394*, 57-71.

Schindler-Rainman, E. & Lippitt, R. The volunteer community: Creative use of human resources. Washington, D. C.: National Training Labs, Institute for Applied Behavioral Science, 1971. (ERIC 053 038.)

Schneeberger, K. C. Gaming as an instrument of farm management education--a development and evaluation. Stillwater, Oklahoma: Oklahoma State University, 1968. (ERIC ED 036 685.)

Schneier, E. The intelligence of Congress: Information and public policy patterns. *The Annals of the American Academy of Political and Social Science*, 1970, *388*, 14-29.

Schools Council. Community service and the curriculum. London, England, 1968. (ERIC ED 049 135.)

Schultz, D. G. The anlaysis of job performance by multidimensional scaling technique. Journal of Applied Psychology, 1964, 48, 329-335.

Schultz, D. G. & Siegel, H. I. The analysis of job performance by multidimensional scaling techniques. Journal of Applied Psychology, 1964, 48, 329-335.

Schultz, D. G., Fische, M. A., Lanterman, R. S., & Siegal, A. I. Absolute scaling of job performance. Journal of Applied Psychology, 1968, 52, 313-318.

Schwartz, A. PPBS and evaluation research: Problems and promises. In E. E. Schwartz (Ed.), Planning-programming-budgeting systems and social welfare. Chicago: The University of Chicago, The School of Social Service Administration, 1970.

Schwartz, M. A. Trends in white attitudes toward Negroes. Chicago: The University of Chicago, National Opinion Research Center, 1967.

Scott, L. C. & Blume, P. R. Some evidence on the economic effectiveness and institutional versus on-the-job training. Social Science Quarterly, 1971, 51 (4), 910-923.

Sears Roebuck and Company Personnel Office, National Sears Training, Retail Induction Training. Turn and learn for successful selling. No. 11588 (F2952 Rev. 1/70), Department 707 Parent, Austin, Texas. (undated)

Sedlak, G. The management value of primetime. M-35582-7-U, S449m, Thesis no. 2290-67, AUL/LRX, Maxwell AFB, AL 36112, 1967.

Shapero, A. The official organization watchers guide. In T. G. Harris (Ed.), Careers today. Del Mar, California: Communications/Research/Machines, Inc., January 1969. (charter issue)

Shariff, Z. Social information and government-sponsored development: A case study from West Pakistan. The Annals of the Academy of Political and Social Science, 1971, 393, 92-108.

Sheffieck, C. F. Management training and evaluation by major United States industrial corporations. Detroit: Wayne State University, 1969. (ERIC ED 041 243.)

Shelburne, J. C. & Graves, K. J. *Education in the armed forces*. New York: The Center for Applied Research, Inc., 1965.

Sheldon, E. B. & Freeman, H. E. Notes on social indicators: Promises and potential. *Policy Sciences*, 1970, *1*, 97-111.

Sheldon, E. B. & Moore, W. E. (Eds.) *Indicators of social change*. New York: Russell Sage Foundation, 1968.

Shinn, A. M. Magnitude estimation: Some applications to social indicators. A Paper Presented at the Annual Meeting of the American Political Science Association, Chicago, Illinois, September 1971. (a)

Shultz, J. & Shultz, M. An annotated review of the literature on volunteering. Washington, D. C.: Center for a Voluntary Society, National Institute for Applied Behavioral Science, 1970.

Siegel, A. I., Schultz, D. G., Fischl, M. A., & Lanterman, R. S. Absolute scaling of job performance. *Journal of Applied Psychology*, 1968, *52*, 313-318.

Silberman, H. F. Design objectives of the instructional management system. A Professional Paper, Santa Monica, California: System Development Corporation, February 1968.

Simon, R. J. Public attitudes toward population and pollution. *The Public Opinion Quarterly*, 1971, *35*, 93-99.

Skovgaard, R. A. A ready force of forward air controllers. M-35582-7-U, S6284r, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Sloan, H. W. Social change, quality of life, and urban affairs: A selective bibliography of current popular literature. Nashville, Tennessee: Center for Community Studies, 1970.

Small Business Administration. *Administrative management course program: Communication and control*. Topic 9. Washington, D. C., 1965.

Smith, D. H. & Inkeles, A. The OM scale: A comparative socio-psychological measure of individual modernity. *Sociometry*, 1966, *29*, 353-377.

Smith, R. G. Controlling the quality of training. Technical Report no. 65-6, Contract with Department of the Army, Washington, D. C.: George Washington University, Human Resources Research Office, 1965.

Smith, R. G. Design of instructional systems. Technical Report no. 66-18, Department of the Army Contract no. DA 44-188-ARO-2, Project no. 2J024701A712 01, Washington, D. C.: George Washington University, Human Resources Research Office, 1966.

Smith, R. G. *The engineering of educational and training systems*. Lexington, Massachusetts: D. C. Heath & Co., 1971.

Smith, R. L. Evaluation of air national guard field training sites. M-32983-U, S6583e, Professional study no. 4027, AUL/LRX, Maxwell AFB, AL 36112, 1970.

Smode, A. F. Human factor inputs to the training device design process. Report no. NAVTRADEVCEN-69-C-0298-1, Orlando, Florida: Naval Training Device Center, September 1971. (ERIC ED 057 606.)

Snyder, A. E. Provide squadron commanders centralized guidance and specialized training to cope with contemporary people problems. M-35582-7-U, S6754p, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Social Science Research Council. Social indicators newsletter. Washington D. C.: SSRC Center for Social Indicators, March 1973.

Soderlind, S. E. The outlook: Appraisal of current trends in business and finance. *Wall Street Journal*, 1970, *51* (14), 1.

Sorem, D. N. The use of military helicopters in civilian medical evacuation roles. M-35582-7-U, S7132u, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Speroff, B. J. Experimental procedures and techniques for evaluating supervisory performance. *Personnel Administration*, 1961, *24* (3), 4-10.

Spivey, R. C. Realistic tactical training. M-35582-7-U, S7611r, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Springer, M. (Ed.) Political intelligence for America's future. The Annals of the American Academy of Political and Social Science, 1970, March, 388.

Springer, M. Social indicators, reports, and accounts: Toward the management of society. The Annals of the American Academy of Political and Social Science, 1970, 388, 1-13.

Stadler, J. T. Training the UPT in tactical fighters. M-35582-7-U, S7771t, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Stanford Research Institute. Toward master social indicators. SRI Project 6747, Research Memorandum EPRC-6747-2, Menlo Park, California: SRI Educational Policy Research Center, 1969.

Stewart, W. J. Determining first-line supervisory training needs. Training and Development Journal, 1970, 24 (4), 12-19.

Stine, V. L. An analysis of agri-business management functions for personnel training. East Lansing, Michigan: Michigan State University, College of Agriculture and Human Resources, 1969. (ERIC ED 045 921.)

Stockdale, J. D. & Aronson, S. Technology and societal change: Selected sources with emphasis on resource allocation. Ithaca, New York: Cornell University, 1970.

Story, W. H. & Waltman, R. P. A study of the education of logistics officers with regard to the use of computer simulation in logistics planning. SLSR-49-67, AFIT/L, Wright-Patterson AFB, OH 45433, 1968.

Stratton, R. P. & Brown, R. Improving productive thinking by training in production and judgement. Paper Presented at the Annual Meeting of the American Educational Research Association, New York, February 1971. (ERIC ED 046 995.)

Strauss, G. Management by objectives: A critical view. Training and Development Journal, 1972, April, 10-15.

Street, P. Community action in an Appalachian county, slower but surer? Lexington, Kentucky: University of Kentucky, 1968.

Studer, R. G. Human systems design and the management of change. A Paper Presented at the Second International Conference on the Problems of Modernization in Asia and the Pacific, Honolulu, Hawaii, East-West Center, August 1970.

Stufflebeam, D. L. Evaluation as enlightenment for decision-making. Columbus, Ohio: Ohio State University, Evaluation Center, January 1968. (ERIC ED 048 333.)

Stufflebeam, D. L. Design of a planning and assessment system for the division of manpower and institutions. Washington, D. C.: National Center for Educational Research and Development, June 1971. (ERIC ED 062 386.)

Sule, O. Interaction between technological and social changes. Futures, 1969, 1, 402-407.

Tagliere, D. A. Organalysis. Training and Development Journal, 1972, April, 30-36.

Taylor, J. F. Planning and organization for the C-5A aircrew training. M-35582-7-U, T2432-7-U, T2432p, Thesis no. 2520-67, AUL/LRX, Maxwell AFB, AL 36112, 1967.

Taylor, W. L. A continuing program of chaplain education. 358.34, A2988s, Student report no. 26, AUL/LRX, Maxwell AFB, AL 36112, 1968.

Teague, R. L. Community power and social change: A case for social action with implications for occupational education. Raleigh, North Carolina: North Carolina State University, Center for Occupational Education, 1969. (ERIC ED 055 223.)

Terleckyj, N. E. Data systems for measuring social change. A Paper Presented at the Annual Meeting of the American Statistical Association, Detroit, Michigan, 1970.

Terleckyj, N. E. Measuring possibilities of social change. Looking Ahead, 1970 (18), 1-11.

Texas A and M University, Engineering Extension Service and Texas Department of Community Affairs. Evaluation study of principles of supervision. College Station, Texas: Texas A and M University, September 1972.

Texas A and M University, Engineering Extension Service, and Texas Education Agency, Industrial Education Service. Suggested basic course outline for police administration. College Station: Texas A and M University. (undated)

Texas Department of Community Affairs, Center for Social Policy and Community Development. Model curricula and training techniques for use in training sub-professional employees of public housing authorities. Philadelphia: Temple University, School of Social Administration, June 1971.

Texas Department of Community Affairs, Community Services Division. Education and training information bulletin. Austin, Texas, 1972.

Texas Department of Community Affairs, Division of Comprehensive Planning. A methodology report on the small communities development program. Austin, Texas, January 1972.

Texas Department of Community Affairs. Management assistance study: Texas model cities program. Austin, Texas, March 1972.

Texas Department of Public Safety. *Management workshop* [upper echelons of management]. Given August 30-September 3, 1971 and September 27-October 1, 1971, Austin, Texas. (undated)

Texas Department of Public Safety, Programmed Instructional Units. *The history of police: Programs #1 and #2.* Austin, Texas. (undated)

Texas Department of Public Safety, Programmed Multi-Media Instructional Units. *Police-community relations: Programs #1, #2, #3, #4.* Austin, Texas. (undated)

Texas Department of Public Safety. Training material hand-outs for first-line supervisors. A Collection of Material, Austin, Texas.

Texas Education Agency, Adult and Continuing Education Division. Evaluation--institutional training MDTA. An Evaluation Instrument, Austin, Texas. (undated)

Texas Education Agency. Program visit report adult and continuing education. Austin, Texas. (undated)

Texas Municipal League. Survey of training needs and evaluation of the 1970-71 Title VIII training program. Austin, Texas: Texas Municipal League for the Texas State Department of Community Affairs. (undated)

Texas State Technical Institute. Evaluation report of community development training programs: Technical manpower and the disadvantaged. Report no. CD 70-517, Waco, Texas, 1971.

Texas Urban Development Commission. Urban Texas: Policies for the future. Austin, Texas, November 1971.

Texas Water Quality Board. Report on training grant no. 638.1.01 authorized under section 5(g) (1) federal water pollution control act. Submitted to Environmental Protection Agency, Dallas, Texas, August 31, 1972.

Thomas, P. J. An evaluation of methods for predicting job performance of personnelmen. Report no. STB-72-4, San Diego: Naval Personnel and Training Research Lab, September 1971. (ERIC ED 058 524.)

Thorley, S. Evaluating an in-company management training program. *Training and Development Journal*, 1969, *23* (9), 48-50.

Thorley, S. What can we do about evaluating management development? *Training in Business and Industry*, 1972, *9* (2), 34-36.

Timpane, P. M. Hard lessons in the assessment of social action programs: The case of ESEA Title I. Washington, D. C.: Deaprtment of Health, Education and Welfare, 1972.

Tinney, R. E. et al. Education in a new era: Innovations today for security tomorrow. M-32983-U, T591e, Professional study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Tinsley, J. S. The Apollo 204 accident: A search for management lessons. M-35582-7-U, T5921a, Thesis no. 1250-68, AUL/LRX, Maxwell AFB, AL 36112, 1968.

Toffler, A. The art of measuring the arts. *The Annals of the American Academy of Political and Social Science*, 1967, *373*, 141-155.

Tracor, Inc. A comprehensive evaluation of the community action program in Austin and Travis County, Texas. Final Report, Austin, Texas, 1969. (ERIC ED 040 315.)

Traffic Institute. Unit course. Evanston, Illinois: Northwestern University.

Training, Research and Development, Inc. Career ladder and curriculum guide for code enforcement inspector. Washington, D. C.

Training, Research and Development, Inc. Career ladder and curriculum guide for zoning inspector. Washington, D. C.

Training, Research and Development, Inc. Handbook for training code enforcement and zoning inspection personnel. Washington, D. C.

Trocki, K. F. et al. An exploratory assessment of CAP evaluation activities. Volume 2. Catalog of Abstracts of Evaluation Studies. Pittsburgh: American Institutes for Research, 1969. (ERIC ED 038 609.)

Truett, H. W. Systems management for air force training. M-32983-U, T86645, Professional study no. 3528, AUL/LRX, Maxwell AFB, AL 36112, 1967.

Tugac, N. Social indicators and social prediction in planning process: A review of literature and bibliography. State Planning Organization Publishing no. DPt: 1124--SPD: 243, Ankara, Turkey: Devlet Planlama Teskilati, Bakanliklar, 1971.

Turner, A. F. The army ROTC--yesterday, today and tomorrow. M-32983-U, T9441a, Research Report no. 3697, AUL/LRX, Maxwell AFB, AL 36112, 1968.

Turney, J. R. Expectancy x valence and intrinsic activity value as predictors of motivation in a technical-professional organization. Proceedings of the Annual Convention of the American Psychological Association, 1972, 7 (1), 453.

Ulrich, G. Indicators of equal opportunity for social mobility in the occupational structure. Unpublished manuscript. Ann Arbor, Michigan: University of Michigan, School of Social Work, 1969.

United Nations. Compendium of social statistics: 1963. New York, 1963.

United Nations. Compendium of social statistics: 1967. New York, 1968.

United Nations Research Institute for Social Development. The concept of development and its measurement. *International Social Development Review*, 1970, *2*, 1-6.

United Nations, Social Development Division. Social policy and the distribution of income in the nation. *Ekistics*, 1969, *28*, 399-405.

U. S. Army Southeast Signal School. *Training evaluation plans*. Ft. Gordon, Georgia, 1969.

U. S. Civil Service Commission: Bureau of Training. *Employee training in the federal service*. FY1968, Washington, D. C., February 1969, CS 1.48: T-7.

U. S. Civil Service Commission: Bureau of Training. Application of a systems approach to training. A case study training systems and technology series: No. II. Washington, D. C.: U. S. Government Printing Office, June 1969. (ERIC ED 058 517.)

U. S. Civil Service Commission: Bureau of Training. Instructional systems and technology: An introduction to the field and its use in federal training. *Training Systems and Technology*, Series no. I, June 1969.

U. S. Civil Service Commission: Bureau of Training. Studies and reports relating to training and education, fiscal year, 1969. CS 1.48: T-6/2.

U. S. Civil Service Commission: Bureau of Training. Studies and reports relating to training and education. T-6, April 1970.

U. S. Civil Service Commission. *Job grading system for trades and labor occupations*. CS 1.41/4: 512-11, trans. 12, Washington, D. C., June 1970.

U. S. Civil Service Commission. Interagency trainin[illegible]grams. Dallas Region, 1971-1972.

U. S. Civil Service Commission. *Management and group performance, a guide for the use of instructors who conduct training for managers at the operating level*. Vol. I (revised), CS17/4: M31/2/1971, Washington, D. C., 1971.

U. S. Civil Service Commission. *Management and group performance, a guide for the use of instructors who conduct training for managers at the operating level*. Vol. II (revised), CS1/74: M31/2/1971, Washington, D. C., 1971.

U. S. Department of Health, Education, and Welfare. *The licensed practical nurse as charge nurse*. Instructor's Guide and Trainee's Guide, Rockville, Maryland: Public Health Service, May 1972.

U. S. Department of Housing and Urban Development. Urban and regional information systems: Support for planning in metropolitan areas. Washington, D. C.: U. S. Government Printing Office, 1968.

U. S. Department of Housing and Urban Development. *Urban intern training*. *A HUD handbook*. Washington, D. C., November 1970.

U. S. Department of Housing and Urban Development. *Files management, general instructions*. *A HUD handbook*. Washington, D. C., April 1971.

U. S. Department of Housing and Urban Development. *Management assistance programs and information systems*. Washington, D. C., January 1972, HH 1.42: 8.

U. S. Department of Housing and Urban Development. *A training model for low rent housing management*. Washington, D. C., 1972.

U. S. Department of Labor, Bureau of Labor Statistics. Three budgets for a retired couple in urban areas of the United States, 1967-68. Bulletin, 1970-6, Washington, D. C.: U. S. Government Printing Office, 1970.

U. S. Department of Labor. USTES employer services training resource. Master Guide and ESTR Series 100, 200, 300, 400, and 900 Guides and Trainee Materials, Contract no. 34-0-0400-000, Washington, D. C.: Manpower Administration, United States Training and Employment Service, April 1971.

University of Louisville, Southern Police Institute. Administrative officers course. A brochure. Louisville, Kentucky, 1972.

University of Louisville, Southern Police Institute. School of police administration. A brochure. Louisville, Kentucky, 1972.

University of North Carolina. Local government administrator's course. Vol. II, Chapel Hill, North Carolina: Institute of Government, 1970.

University of North Carolina. Local government administrator's course. Vol. III, Chapel Hill, North Carolina, Institute of Government, 1970.

Valen, R. D. Teacher training for faculty duty at squadron officer school. M-35582-7-U, V152t, Research study no. 1328-70, AUL/LRX, Maxwell AFB, AL 36112, 1971.

Vanderwaal, G. W. Undergraduate pilot training: A new method. M-35582-7-U, V242u, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Vanecko, J. L. & Jacobs, B. The impact of the community action program on institutional change: assistance to community organization as a successful strategy. Final Report, Chicago: National Opinion Research Center, May 1970. (ERIC ED 044 582.)

Venable, J. C. & Romer, R. A. An analysis of the impact of tactical re-organization on avionics maintenance training. SLSR-15-67, AFIT/L, Wright-Patterson AFB, OH 45433, 1968.

Verba, S. Democratic participation. The Annals of the American Academy of Political and Social Science, 1967, 373.

Verborgh, R. Teaching mining mastery and mine security: Some methodological reflections. Revue de l'Institut de Sociologie (Solvay), 1971, 1, 59-66.

Veri, C. C. & Vonder Haar, T. A. Training the trainer. St. Louis: Missouri University, Extension Division. (undated) (ERIC ED 048 574.)

Vestermark, S. D. Social indicators of social effects and the social inventory after attack. Symposium Presented at Meeting of Advisory Committee on Civil Defense and Office of Emergency Planning, Fort Monroe, Virginia, November 1968.

Vine, N. R. Visual illusions--a cause of aircraft accidents. M-35582-7-U, V782v, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Viteles, M. S. Program of humanistic studies for Bell System executives, University of Pennsylvania (1953-60), long-range impact on managerial attitudes and behavior: A follow-up survey. Pennsylvania: Bell of Pennsylvania, 1969.

Vonder Haar, T. A. Performance standards for managers. *Personnel Journal*, 1972, *51* (1), 27-31.

Vroom, V. H. Ego involvement, job satisfaction and job performance. *Personnel Psychology*, 1962, *15*, 159-177.

Waad, C. E. Error analysis simplified. M-32983-U, W874e, Professional study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Waddell, R. Selection and utilization of test pilots in the United States Army. M-35582-7-U, W176s, Research study no. 1345-70, AUL/LRX, Maxwell AFB, AL 36112, 1970.

Walker, A. E. A measurement system for future undergraduate pilot training. M-35582-7-U, W1771m, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Wallace, R. C. & Shavelson, R. J. A systems analytic approach to evaluation: A heuristic model and its application. Syracuse, New York: Eastern Regional Institute for Education, 1970. (ERIC ED 058 292.)

Walter, C. W. A survey and discussion of education required to prepare new air force officers for effective assumption of supervisory duties as required under the resources management systems (RMS) concepts. SLSR-14-71B, AFIT/L, Wright-Patterson AFB, OH 45433, 1972.

Walters, M. L. Pilots at a lower cost. M-32983-U, W2354p, Professional study no. 4255, AUL/LRX, Maxwell AFB, AL 36112.

Wardrop, J. L. Determining most probable causes: A call for re-examining evaluation methodology. New York: American Educational Research Association, February 1971. (ERIC ED 048 337.)

Wasson, K. W. & O'Connell, H. J. Social indicators: The bibliographic review as a first step toward scientific inquiry. Unpublished paper, Ames, Iowa: Iowa State University, Department of Sociology, 1971.

Webb, W. B. An analysis of junior officer manager development in the SAC operational wing. M-35582-7-U, W368a, Thesis no. 2770-67, AUL/LRX, Maxwell AFB, AL 36112, 1967.

Weinman, B., Sanders, R., Kleiner, R., & Wilson, S. Community based treatment of the chronic psychotic. _Community Mental Health Journal_ 1970, _6_ (1), 13-21.

Welsh, D. A. Computer-assisted instruction in military and industry. M-35582-7-U, W461c, Thesis no. 1310-68, AUL/LRX, Maxwell AFB, AL 36112, 1968.

Wenig, R. E. & Wolansky, W. D. Review and synthesis of literature on job training in industry. Columbus, Ohio: Ohio State University, The Center for Vocational and Technical Education, June 1972.

Wenstrand, A. P. A study of air combat maneuvering training in the U. S. Air Force. M-35582-7-U, W476s, Research study no. 2100-71, AUL/LRX, Maxwell AFB, AL 36112.

West, C. B. An analysis of junior rated officer retention in tactical air command. M-35582-7-U, W516a, Thesis no. 2790-67, AUL/LRX, Maxwell AFB, AL 36112, 1967.

Westbach, E. O. An analysis of a specialized vs. generalized approach to pilot training. M-35582-7-U, W5232a, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Whalen, J. P. Sensitivity training as an aid to air force leadership development. M. B. A. Thesis, Columbus, Ohio: Ohio State University, 1967.

Whitcomb, M. A. (Ed.) Recent developments in vision research. Washington, D. C.: National Academy of Sciences--National Research Council, 1966.

Whitlock, G. H. Application of the psychophysical law to performance evaluation. _Journal of Applied Psychology_, 1963, _47_, 15-23.

Why are public housing directors retiring or being fired? Journal of Housing, 1971, 28 (2), 86-88.

Wickert, F. R. & McFarland, D. E. (Eds.) Measuring executive effectiveness. New York: Appleton-Century-Crofts, 1967.

Widdison, H. A. & Skipper, J. K. The use of an interval scale technique with occupational prestige rankings. A Paper Presented at the Annual Meeting of the American Sociological Association, Denver, Colorado, August 30-September 2, 1971.

Wilber, G. L. Determinants of poverty. A Paper Prepared for the Joint Session of the American Sociological Society, Denver, Colorado, August 1971.

Wilcox, L. D. & Brooks, R. M. Social indicators: An alternative approach for future research. Ames, Iowa: Iowa State University, 1971.

Wilcox, L. D. & Brooks, R. M. Toward the development of social indicators for policy planning. A Paper Presented at the Annual Meeting of the Ohio Valley Sociological Society, Cleveland, April 1971.

Wilcox, L. D., Brooks, R. M., Beal, G. M., & Klonglan, G. E. Social indicators and societal monitoring, an annotated bibliography. San Francisco: Jossey-Bass, Inc., Pub., 1972.

Wilcox, L. D., Brooks, R. M., Beal, G. M., & Klonglan, G. E. Social indicators: Recent trends and selected bibliography. Sociological Inquiry, 1972, 42 (1), 37-50.

Wilcox, R. B. The application of feedback control techniques to organizational systems. IRE Transactions on Automatic Control, Vol. AC-7, 1962, March, 55-67.

Wilensky, H. L. Organizational intelligence: Knowledge and policy in government and industry. New York: Basic Books, 1967.

Wilensky, H. L. Intelligence in industry: The uses and abuses of experts. The Annals of the American Academy of Political and Social Science, 1970, 388, 46-58.

Wilkins, W. The managerial grid seminar: Its potential for use by air command and staff college. M-35582-7-U, W6851m, Research study no. 1390-70, AUL/LRX, Maxwell AFB, AL 36112, 1971.

Willhelm, S. M. The concept of the ecological complex: A critique. *The American Journal of Economics and Sociology*, 1964, *23*, 241-249.

Williams, C. F. Maintenance officer training: A combined approach. M-35582-7-U, W7223n, Research study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Williams, J. D. *The compleat strategist: Being a primer on the theory of games of strategy*. New York: McGraw Hill, 1954.

Williams, Lady. The revolution in industrial training. *Sociological Review Monograph*, 1969, *14*, September, 89-104.

Williams, R. M. Individual and group values. *The Annals of the American Academy of Political and Social Science*, 1967, *371*, 20-37.

Wilson, R. J. An investigation of factors essential to selecting and preparing on-the-job trainers for a post secondary cooperative vocational-technical education program. Ann Arbor, Michigan: University Microfilms, Inc., 1970. (ERIC ED 043 770.)

Wirt, F. M. (Ed.) Future directions in community power research: A colloquium. Berkeley, California: The University of California, Institute of Government Studies, 1971. (ERIC ED 054 529.)

Witherspoon, A. D. A behavioral observation index designed to evaluate training of correctional officers in a prison setting. Masters Thesis, Auburn University, August 1971. (ERIC ED 058 546.)

Wood, W. K. A training model for low rent housing management. A training kit for instructors. Contract no. 1101 with Department of Housing and Urban Development, Philadelphia: Stokes, Wood & Associates. (undated)

Woske, D. G. For TAC mission effectiveness--air crew stan/eval. M-32983-U, W935f, Professional study no. 4484, AUL/LRX, Maxwell AFB, AL 36112.

Wray, R. O. Big stick II, a general war exercise. M-32983-U, W94326, Professional study, AUL/LRX, Maxwell AFB, AL 36112, 1972.

Yost, M. & Monnin, F. J. A systems approach to the development of an evaluation system for ESEA Title III projects. Bethesda, Maryland: ERIC Document Reproduction Service, 1969. (ERIC ED 047 356.)

Zachert, M. J. K. & Pantelides, V. S. A computer-assisted sequential in-basket technique. Educational Technology, 1971, December, 44-45.

Zachert, M. J. K. & Pantelides, V. S. SIBE: A sequential in-basket exercise technique. Tallahassee, Florida: Florida State University, 1971. (ERIC ED 056 469.)

Zadeh, L. A. On the definition of adaptivity. Proceedings of the IEEE, 1963, 51 (March), 469-470.

Zolnerowich, P. The development of a religious education teacher corps. 358.34, A2988s, Student Report no. 22, AUL/LRX, Maxwell AFB, AL 36112, 1968.

Zucker, C. Environmental measurement. New York: City College of the City University of New York, School of Architecture and Environmental Studies, Urban Research Group, 1971.

Zwiebach, B. Democratic theory and community control: Community issues, March 1969. Flushing, New York: City University of New York, Institute for Community Studies, March 1969. (ERIC ED 050 205.)

ADDENDUM

American Psychological Association, Inc. Publication manual of the American Psychological Association. 1967 Revision, Washington, D. C.: American Psychological Association, Inc., 1967.

Ammerman, H. L. Development of procedures for deriving training objectives for junior officer jobs. Technical Report no. 66-3, Washington, D. C.: The George Washington University, Human Resources Research Office, May 1966.

Anastasi, A. *Psychological Testing*. Second Edition, New York: Macmillan, 1954.

Anastasi, A. *Psychological Testing*. Third Edition, New York: Macmillan, 1968.

Baker, E. L. The technology of instructional development. In R. M. W. Travers (Ed.), *Second handbook of research on teaching*. Chicago: Rand McNally, 1973.

Briggs, L. J. et al. *Instructional media*. Monograph no. 2, Pittsburgh: American Institutes for Research, 1967.

Bloom, B. S., Engelhart, M. D., Furst, E. J., Hill, W. H., Krathwohl, D. R. *Taxonomy of Educational Objectives, The Classification of Educational Goals, Handbook I: Cognitive Domain*. New York: David McKay Company, Inc., 1956.

Bloom, B. S., Haskings, J. T., and Madaus, G. F. *Handbook on Formative and Summative Evaluation of Student Learning*. New York: McGraw-Hill, 1971.

Borus, M. E. and Tash, W. R. *Measuring the Impact of Manpower Programs. A Primer*. Ann Arbor, Michigan: Institute of Labor and Industrial Relations, The University of Michigan, Wayne State University, November 1970.

Brewer, G. D. *Politicians, Bureaucrats and the Consultant*. New York: Basic Books, 1973.

Bush, W. J., Gregg, K. D., Smith, E. A., and McBride, C. B. Some interactions between individual differences and modes of instruction. AMRL-TR-65-228, Aerospace Medical Research Laboratories, Aerospace Medical Division, Air Force Systems Command, Wright-Patterson AFB, Ohio, December 1965.

Carter, L. F. Exercising the executive decision-making function in large systems. In Glaser R. (Ed.), Training Research and Education. Pittsburg: University of Pittsburg Press, 1962.

Clark, H. E. and Sloan, H. S. Classrooms in the Factories. New York: University Press, 1958.

Cronbach, L. J. Course improvement through evaluation. Teacher College Record. 64. (May), 1963.

Cronbach, L. J. Essentials of Psychological Testing. New York: Harper and Row, Pub., 1970.

Cronbach, L. J., and Gleser, G. C. Psychological Tests and Personnel Decisions. Second Edition, Urbana, Illinois: University of Illinois Press, 1965.

Dale, E. and Chall, J. A formula for predicting readability. Educational Research Bulletin, 1948, 27, 11-20.

Dale, E. and Chall, J. A formula for predicting readability: Instructions. Educational Research Bulletin, 1948, 27, 37-54.

Dossett, W. F. Likelihood ratio analysis (LRA): A new technique of information-variance analysis. HFR Special Report. Goleta, California: Human Factors Research, Inc., 1965.

Duncan, O. D. Toward social reporting: next steps. Social Science Frontiers, Volume 2. New York: Russell Sage Foundations, 1972.

Evaluation for local manpower program planners. Background Notes for a Presentation at City Manpower Planners Meeting, 77-Attachment 4, Louisville, Kentucky, May 24, 1971.

Fattu, N. A. A catalog of trouble shooting tests. Research Report no. 1, Bloomington, Indiana: Indiana University, Institute of Educational Research, December 1956.

Flanagan, J. C. The critical incident technique. Psychological Bulletin, 1954, 51, 327-358.

Flanagan, J. C. and Miller, R. B. The performance record: Handbook for foremen and supervisors of hourly employees. Chicago: Science Research Associates, 1955. (a)

Flanagan, J. C. and Miller, R. B. The performance record: Handbook for supervisors of non supervisory salaried employees. Chicago: Science Research Associates, 1955. (b)

Flanagan, J. C. and Miller, R. B. The performance record: Handbook for superintendents and general foremen. Chicago: Science Research Associates, 1955. (c)

Flanagan, J. C. and Miller, R. B. The performance record: Administrators manual. Chicago: Science Research Associates, 1955. (d)

Fleishman, E. A. The description and prediction of perceptual-motor skill learning. In Glaser, R. (Ed.), Training Research and Education. Pittsburg: University of Pittsburg Press, 1962.

Frederiksen, N. Proficiency tests for training evaluation. In Glaser, R. (Ed.), Training Research and Education. Pittsburg: University of Pittsburg Press, 1962.

Gagne, R. M. (Ed.) Psychological principles in system development. New York: Holt, Rinehart and Winston, 1962.

Garn, H. A. Planning, allocation and control in a decentralized, comprehensive manpower program. Washington, D. C.: Urban Institute, June 1971.

Ghiselli, E. W. and Brown, C. W. Personnel and industrial psychology. New York: McGraw-Hill, 1955.

Glaser, R. M. and Nitko, A. J. Measurement in learning and instruction. In R. L. Thorndike (Ed.), Educational measurement. Washington, D. C.: American Council on Education, 1971.

Glennan, T. K. Evaluating federal manpower programs: Notes and observations. Memorandum RM 5743-OEO, Santa Monica, California: Rand Corporation, September 1969.

Gregg Division/McGraw-Hill Book Company and the Center for Vocational and Technical Education at the Ohio State University. Writing performance goals: Strategy and prototypes. New York: Gregg McGraw-Hill.

Guilford, J. P. Fundamental statistics in psychology and education. New York: McGraw-Hill Book Company, 1965.

Guion, R. M. Personnel testing. New York: McGraw-Hill, 1965.

Henriot, P. J. Political aspects of social indicators: Implications for research. Social Science Frontiers, Volume 4. New York: Russell Sage Foundations, 1972.

Human Resources Research Office. Interim bibliography of publications. Alexandria, Virginia: The George Washington University, July 1--December 31, 1967.

Human Resources Research Office. Use of job and task analysis in training. Professional Paper no. 1-69, Washington, D. C.: The George Washington University, January 1969.

Insko, C. A. Theories of attitude change. New York: Appleton-Century-Crofts, 1967.

Jones, M. V. and Flax, M. J. The quality of life in metropolitan Washington, D. C.: Some statistical benchmarks. Washington, D. C.: The Urban Institute, March 1970.

Kopkind, A. The future-planners. The New Republic, 1967, 156, (8), 19-23.

Lippitt, G. L. Emerging trends in training and development. Training and Development Journal, 1969, 23 (2), 2-3.

Mackie, R. R., Wilson, C. C., Buckner, D. N., DeLoach, W. D., Dossett, W. F., and Ross, E. B. Practical performance test batteries for electrician's mates and radio men. (Developed in conjunction with a manual for use in the preparation and administration of practical performance tests for the Bureau of Naval Personnel (Pers 15), U. S. Navy and the Personnel and Training Branch, Psychological Sciences Division, Office of Naval Research.) Contract Nonr 876 (00). Los Angeles: Management and Marketing Research Corporation, 1953.

Mager, R. F. Developing attitude toward learning. Belmont, California: Fearon Pub./Lear Siegler, Inc., 1968.

Mager, R. F. and Beach, K. M., Jr. Developing vocational instruction. Palo Alto, California: Fearon Pub., 1967.

McClelland, W. A. The process of effecting change. Professional Paper no. 32-68, Washington, D. C.: The George Washington University, Human Resources Research Office, October 1968.

McGeoch, J. A. and Irion, A. L. The psychology of bureau learning. Second Edition. New York: Longman, 1952.

Miller, R. B. Analysis and specification of behavior for training. In Glaser, R. (Ed.), Training Research and Education. Pittsburg: University of Pittsburg Press, 1962.

Nitko, A. J. Criterion-referenced testing in the context of instruction. Pittsburg: University of Pittsburg, Learning Research and Development Center, 1972.

Scanlon, J. W., Buchanan, G., Nay, J., and Wholey, J. An evaluation system to support planning, allocation and control in a decentralized, comprehensive manpower program. A Final Report, Washington, D. C.: Urban Institute, March 1971.

Shinn, A. M. Measuring the utility of housing: demonstrating a methodological approach. Social Science Quarterly, 1971, June, 88-102. (b)

Smith, R. G. An annotated bibliography on the design of instructional systems. Technical Report no. 67-5, Alexandria, Virginia: The George Washington University, Human Resources Research Office, May, 1967.

Smith, R. G. The engineering of educational and training systems. Lexington, Massachusetts: Heath Lexington Books, 1971.

Standlee, L. S., Popham, W. J., and Fattu, N. A. A review of troubleshooting research. Research Report no. 3, Bloomington, Indiana: Indiana University, Institute of Educational Research, December 1956.

Steinmetz, C. S. The evolution of training. In R. L. Craig and L. R. Bittel (Eds.), Training and development handbook. New York: McGraw-Hill, 1967.

Stufflebeam, D. I., Foley, W. J., Gephart, W. J., Guba, E. G., Hammand, R. I., Merriman, H. O., and Provus, M. M. Educational evaluation and decision making. Itasca, Illinois: F. E. Peacock Publishers, Inc., 1971.

Tarleton, H. R. Mobilization augmentees in ICBM operations. M-32983-U, T188m, professional study. AUL/LRX, Maxwell AFB, AL 36112, 1972.

Taylor, E. W. The influence of rating scale construction upon the characteristics of ratings rendered. Cleveland: Personnel Research and Development Corporation, 1958.

Tracey, W. R. Evaluating training and development systems. New York: American Management Association, Inc., 1968.

Travers, R. M. W. A study of the relationship of psychological research to educational pratice. In Glaser, R. (Ed.), Training research and education. Pittsburg: University of Pittsburg Press, 1962.

Triandis, H. C. Attitude and attitude change. New York: John Wiley and Sons, Inc., 1971.

Turabian, K. L. A manual for writers of term papers, theses, and dissertations. Third Edition, Revised, Chicago: The University of Chicago Press, 1967.

Tyler, R. W. Analysis of the Purpose, Pattern, Scope and Structure of the Officer Education Program of Air University. Maxwell AFB, Alabama: Officer Education Research Laboratory, Air Force Personnel and Training Research and Development Command, May 1955.

United States Air Force, Office of Information. Air training command fact sheet. September 1972.

U. S. Civil Service Commission, Bureau of Training. Studies and reports relating to training and education. Pamphlet T-6, FY1969, Washington, D. C., March 1970, CSI.48:T-6/2.

U. S. Civil Service Commission, Bureau of Training. Training evaluation: A guide to its planning, development and use in agency training courses. Training Systems and Technology Series: no. IV, May 1971.

Veldman, D. J. Fortran Programming for The Behavioral Sciences. New York: Holt, Reinhart and Winston, 1967.

Webb, E. J., Campbell, D. T., Schwartz, R. D., and Sechrist, L. Unobstrusive Measures: Nonreactive Research in the Social Sciences. Chicago: Rand McNally, 1966.

Wenig, R. E. and Wolansky, W. D. Review and synthesis of literature on job training in industry. Columbus, Ohio: ERIC Clearinghouse on Vocational and Technical Education, 1972.

Wilcox, L. D., Brooks, R. M., Beal, G. M., and Klonglan, G. E. Social indicators and societal monitoring, an annotated bibliography. San Francisco: Jossey-Bass Inc., Pub., 1972.

Wilson, C. L. On-the-job and operational criteria. In Glaser, R. (Ed.), Training research and education. Pittsburg: University of Pittsburg Press, 1962.

Appendix A

Outline of Underlying Assumptions for DOES Development

1.41 Sampling Assumptions

- 1.411 Sampling Assumptions/Population
  - 1.4111 Training Population
    - 1.41111 Trainees are representative of the class of employees for whom the training is intended (e.g., sex, size of community)
  - 1.4112 Training Instructors
    - 1.41121 T.I. are representative of all such T.I. who provide such training
  - 1.4113 Decision Makers
    - 1.41131 D.M. are representative of all such D.M. who use decision information
      - 1.411311 Middle Management
      - 1.411312 Top Management
  - 1.4114 Evaluators
    - 1.41141 Evaluators who use this system are representative of evaluators who value and employ a decision orientation to evaluation
  - 1.4115 On the Job Co-workers
    - 1.41151 Co-workers are representative of an occupational class with whom trainees interact
      - 1.411511 Peers
      - 1.411512 Subordinates
      - 1.411513 Superiors

1.4116 Community members who provide impact data

1.41161 Are representative of class of people being sampled

1.412 Work Sampling

1.4121 Skill performances to which training is being given is important and representative of the class of behavior which an occupation should possess.

1.413 Time Sampling

1.4131 Distance from training

1.41311 Community impact

First sample = 3 to 6 months after treatment

Second sample = 15 to 18 months after treatment

1.4132 Amount of time sampled

1.41321 Job performance

1.413221 Behavior -- 8 to 24 hours/person

1.413222 Records --

1 year prior to training/time samples and training to visitation

1.41322 Community impact (size of temporal unit)

1.413221 Records -- scan 1 year observation period

1.413222 Direct observation -- 5 days/observation period

1.413223 Interviews -- 5 days/observation period

1.42 Treatment Assumptions

- 1.421 Treatment Delivery (skills)
  - 1.4211 The treatment will produce the skill behaviors it has specified as outcomes
  - 1.4212 There will be a transfer of treatment effects to job performance
  - 1.4213 There will be a transfer of job performance effects in terms of indicators of community impact related to training. (There will be a transfer of effects from treatment through job performances to a community impact indicator.)
- 1.422 Additional Treatment Effects
  - 1.4221 Awareness will increase
    - 1.42211 Cognitive outcomes
    - 1.42212 Affective outcomes
  - 1.4222 Attitudes will change
  - 1.4223 Knowledge increments will occur

1.43 Measurement Assumptions

- 1.431 General Measurement Assumptions
  - 1.4311 Instruments used to measure effects of training, job performance, and community impact will be non-threatening
    - 1.43111 Unobtrusive measures/Observations techniques
    - 1.43112 Simulation/Problem solving activities will be used
  - 1.4312 The evaluation system will make use of natural data (historical records, process records) where possible.

1.4313 Trained observers/interviewers are the only authorized data gatherers.

1.4314 Where possible data will be collected in its natural setting.

1.4315 Longitudinal and cross-sectional data will be collected where possible

1.4316 All ratings will be made by trained raters.

1.4317 Evaluator will be allowed to place trained observers in the system whenever and wherever necessary (training package development, training situation, job environment, and community)

1.4318 Validity and reliability will be determined for all data collection devices before those devices are used to obtain evaluation data on treatment, job performance, and community impact.

1.432 Training Materials Measurement Assumptions

1.4321 Reliability of rating evaluation of training materials

1.43211 Interrater agreement

1.43212 Intrarater agreement

1.4322 Quality of package can be developed

1.43221 Expert analysis

1.432211 Format

1.432212 Content adequacy/relevancy/
internal consistency

1.432213 Intelligibility

1.43222 Reliability of experts' analyses will be determined

1.43223 Ratings can be scaled on a quality/index basis

1.4323 There is face validity of the package -- it is addressed to the needs/problems for which the contract was let.

1.4324 Indices of reliability, and validity can be developed and will be functionally useful for making decisions.

1.433 Training Process (Treatment) Measurement Assumptions

1.4331 Not everything can be measured

1.4332 We can measure the extent to which objectives of training are being met.

1.4333 We can define variables affecting successful/ unsuccessful achievement of training objectives (diagnostic information)/Variables =

1. Simulation
2. Workshop
3. Seminar
4. Lecture
5. Self-study
6. Trainees
7. Instructors
8. Behavioral Objectives
9. Materials
10. Self-evaluation
11. Monitoring
12. Roles
13. Interaction

14. Setting
15. Performances
16. Attitude
17. Length of training
18. Duration
19. Exit/Entry Level/Behavior Skills
20. Skill training
21. Knowledge increment
22. Awareness
    a) affective
    b) cognitive

1.434 Job Performance Measurement Assumptions

1.4341 Variables for measuring job performance can be found or developed that are directly related to skills developed in training (performance measurement devices and ratings)

1.4342 Job performance measures will provide valid criteria for the evaluation of transfer training effects

1.4343 Data from "job records" can be obtained which are related to skills developed in training. (Before and after treatment.)

1.435 Community Impact Measurement Assumptions

1.4351 Indicators of "community impact" can be related to training objectives and that the intervening process of job performances mediates between objectives of training and bring about changes in the community.

1.44 Analysis Assumptions

1.441 Training Materials

1.4411 Ratings of training materials will provide goodness/badness descriptions for the total package and sub-package elements

1.44111 The standard for rating is valid and reliable

1.44112 The standard is used for comparative purposes by judges to yield descriptions

1.442 Training Materials Implementation Analysis Assumptions

1.4421 Analyses will be performed to describe and explain (account for statistically) training effects

1.4422 Analyses to describe and explain training effects will be used to

a) provide for validation/selection and refinement of "package analysis criteria"

b) predict job performance and impact criteria

1.443 Job Performance Analysis Assumptions

1.4431 Comparative analyses will be conducted to compare end of training performance with job performance

1.4432 Explanatory analyses will be conducted to determine presence or absence of transfer of training effects to job performance

1.444 Community Impact Analysis Assumptions

1.4441 Impact analyses will describe observable effects in the community directly or indirectly related to training and job performance

1.4442 Impact analyses could be used to compare observable effects of training with control communities

1.4443 Impact analysis will be used to explain the presence or absence of observable effects on the community related directly/indirectly to training and job performance.

1.445 General Analysis Assumptions

1.4451 Predictive analyses might be performed to ascertain the relationship between critical variables related to training, job performance, and community impact and hypothesized future response capability.

1.4452 Change score analyses will not be conducted; control group comparative analyses provide the best alternatives to describing and explaining effects of training, job performance and community impact.

1.4453 Analyses will be performed on only clearly demonstrable phenomena.

1.446 Statistical Analysis Assumptions

1.4461 The types of data available and the questions to be answered control the statistical analyses to be employed.

1.4461 The sampling plan derives from data available, questions to be answered, constraints, and evaluation design; the above determine data to be collected.

1.4462 Statistical analysis to be used may include the following:

- a) Correlational analysis
- b) Analysis of variance
- c) Analysis of covariance
- d) Regression analysis
- e) Multiple regression analysis
- f) Distribution free analysis

3.1 Preparation of Reports

3.11 Report Audiences -- Reports of evaluation will be directed to:

3.111 Decision makers

Local (top, middle, technical)
State (top, middle, technical)
National (top, middle, technical)

3.112 Developers

3.113 Evaluators

3.12 Reporting Levels -- Types of reports

3.121 Technical Reports

3.122 Technical Report Abstract

3.123 Decision Information Summary

APPENDIX B

Training or Information Sites Visited

by the Search & Analysis Team

The individuals who gave generously of their time and shared their thinking on training and evaluation are:

Floyd Hacker
Administrator of D.P.S. Training
Texas Department of Public Safety
5805 North Lamar
Austin, Texas
September 11, 1972

T Sgt. Ronald Moon
Head, Manager Training School
Bergstrom Air Force Base
Bastrop Road
Austin, Texas
September 14, 1972

Warren Adkins
Manpower Training Program
Texas Employment Commission
P. O. Box 160
Austin, Texas
September 18, 1972

C. Robert Woods
D.P.S. Programmed Courses
Plannet Association
900 West Koenig Lane #117
Austin, Texas
September 22, 1972

T Sgt. Vozza
N.C.O. School
Bergstrom Air Force Base
Bastrop Road
Austin, Texas
September 25, 1972

Maj. Gen. Gordon F. Blood and
Lt. Col. James Boyd
12th Air Force
Bergstrom Air Force Base, Texas
September 26, 1972

Lynn Anderson
Dean of the Office of Conference and Training
LBJ School of Public Affairs
Sid Richardson Hall
Unit 3, Room 3.13
Austin, Texas
September 27, 1972

David Spurgin
Texas State Job Training Program
LBJ School of Public Affairs
Sid Richardson Hall
Unit 3, Room 3.13
Austin, Texas
September 29, 1972

Bill Wettington
Safeway District Manager
6101 North Hampton
Austin, Texas
October 3, 1972

Joe Riordian
Public Relations Manager
Southwestern Bell Telephone Company
Austin District
909 Colorado
Austin, Texas
October 4, 1972

Tom Phillips
Sears Introductory and Sales
Personnel Training
Hancock Shopping Center
Austin, Texas
October 5 and 12, 1972

Malcolm McClinchie
Training Officer
IBM
11400 FM Road 1325
Austin, Texas
October 25, 1972

Al Jones
Coordinator of Manpower Training
Texas Education Agency
Brown Building, Room 209
Austin, Texas
October 30, 1972

APPENDIX C

LIBRARY REFERENCES SEARCHED

Encyclopedia Search

Encyclopedia of Educational Research

Dates Searched: 1969 (fourth edition, pp. 1-124)

Major Descriptors Used: supervision, housing maintenance management, training, on the job performance, community impact

Minor Descriptors Used: education, socialization, community development, political socialization

Location: Education and Psychology Library

Catalog Search

Monthly Catalog

Dates Searched: (1) January, 1970--December, 1970; (2) January, 1971--September, 1972

Major Descriptors: (1) supervision, housing maintenance management, training, on the job performance, community impact; (2) evaluation, community impact, housing maintenance management, supervision

Minor Descriptors Used: (1) job education, decision-making, government training, military training, manpower, job corp; (2) management, administrative management, training, middle management, job descriptors, city administration

Location: Documents Library, Main Building, 3rd floor; also, State Library Building, 12th and Brazos Streets, main reading room.

General Files Search

Location: Texas Department of Community Affairs, Sam Houston Building, 14th and San Jacinto Sts.,

Materials Searched: training, evaluation, city management, housing management, community impact, low-rent housing, training packets, local government.

Index Search

ERIC--C.I.J.E.

Dates Searched: 1969--1972

Major Descriptors Used: supervision, housing management training, job performance, community impact, evaluation, taxonomies of training objectives.

Minor Descriptors Used: action programs, action research, administrative personnel, administrative education, affective objectives, community involvement, community analysis, decision-making, evaluation, housing, management education, job analysis, planning, program administration, systems analysis, training, validity, environmental criteria, social characteristics, community change, community study, social influences, social action, community services, evaluation, state programs, training objectives, taxonomy, job skills, task performance, skill analysis, objectives, performance criteria, evaluation methods, site analysis, participant satisfaction, program evaluation, cost effectiveness, supervisory training, transfer of training

Location: Research and Development Library, Education and Psychology Library.

ERIC--R.I.E.

Dates Searched: 1969--1972

Major Descriptors Used: supervision, housing management, training, job performance, community impact, evaluation, taxonomies of training objectives.

Minor Descriptors Used: action programs, action research, administrative personnel, administrator evaluation, affective objectives, community involvement, community analysis, decision-making, evaluation, housing, management evaluation, job analysis, planning, program administration, systems analysis, training, validity, environmental criteria, social characteristics, community change, community study, social influences, social action, community services, evaluation, state programs, training objectives, taxonomy, job skills, task performance, skill analysis, objectives, performance criteria, evaluation methods, site analysis, participant satisfaction, program evaluation, cost effectiveness, supervisory training, transfer of training.

Location: Education and Psychology Library

Index of Business Periodicals

Dates Searched: January, 1971--December, 1971

Major Descriptors Used: supervision, housing maintenance management, training, on the job performance, community impact

Minor Descriptors Used: management training, business management and supervision, personnel management, housing management, community studies, evaluation techniques, administrative education, theories of decision-making

Location: Business Administration Library, B.E.B.

Psychological Abstracts

Dates Searched: (1) June, 1968--December, 1969; (2) January, 1970--October, 1972

Major Descriptors Used: (1) training, on the job performance, community impact; (2) supervision and housing maintenance management, training, on the job performance, community impact

Minor Descriptors Used: (1) management, evaluation; (2) personnel management, decision-making, education, evaluation, community impact, social indicators, supervisors, training methods, management, housing, methodology

Location: Education and Psychology Library

Sociological Abstracts

Dates Searched: January, 1970--December, 1971; February--August, 1972

Major Descriptors Used: community impact, community change, evaluation, social indicators, training

Minor Descriptors Used: job training, evaluation, impact, community, community development, community relations, cities, city planning, index, indicators, social, social action, social change, social planning, social research.

Location: Main Library, Social Science Reference Room

U.S. Government Research and Development Reports

Dates Searched: January, 1970--December, 1970

Major Descriptors Used: supervision, training, on the job performance

Minor Descriptors Used: evaluation, government training, supervisory training, management training, technical training

Location: Documents Library, 3rd floor, Main Building

Air University Abstracts of Research Reports

Dates Searched: 1968, 1970, 1971, 1972

Descriptors: Specific descriptors were indexed under general headings. Therefore, the entire subject index was searched for community impact, job performance, training, and evaluation.

Location: Air Force ROTC Office, ROTC Building,
Air University Library, Maxwell Air Force
Base, Alabama

Journal Search

Canadian Public Administration

Dates Searched: Summer--Fall, 1972

Major Descriptors Used: housing maintenance and management community impact

Location: Social Science Reference Room

Journal of Applied Psychology

Dates Searched: January, 1969--January, 1970

Major Descriptors Used: community impact, supervision and housing maintenance management

Minor Descriptors Used: management, training, evaluation

Location: Education and Psychology Library

Journal of Housing

Dates Searched: January, 1970--December, 1972

Major Descriptors Used: supervision and housing management, training, on the job performance, community impact

Minor Descriptors Used: government training, government on the job performance, government evaluations of: training, on the job performance, community impact, building supervisors, decision-making, social indicators

Location: Architecture Library (Architecture Building)

International Journal of Politics

Dates Searched: January, 1970--December, 1971

Major Descriptors Used: community impact

Minor Descriptors Used: job training, evaluation, impact, community, community development, community relations

Location: Main Library, Social Science Reference Room

Training and Development Journal

Dates Searched: (1) January, 1968--May, 1968; (2) June, 1968 --January, 1969

Major Descriptors Used: (1) community impact, job performance, training, supervision housing maintenance management; (2) community impact, supervision and housing maintenance management

Minor Descriptors Used: (1) job training, evaluation, impact, community, management training, education, military training, military education, community development, community relations; (2) management, training, evaluation

Location: Business Library: B.E.B.

Public Administration: Journal of the Royal Institute of Public Administration

Dates Searched: Summer, 1972--Autumn, 1972

Major Descriptors Used: housing maintenance management, community impact

Location: Main Library, Social Science Reference Room

Urban Research News (a newsletter)

Dates Searched: January 5, 1970--January 18, 1971

Major Descriptors Used: housing management

Minor Descriptors Used: housing studies, low-rent housing, urban housing

Location: Main Library, Social Science Reference Room

Bibliography Search

Beal, George M., Brooks, Ralph M., Wilcox, Leslie D., and Klonglan, Gerald E. *Social indicators: bibliography I* (Report no. 92). Ames, Iowa: Iowa State University, Department of Sociology and Anthropology, 1971.

Location: Main Library, Social Science Reference Room

Wilcox, L.D., Brooks, R.M., Beal, G.M., and Klonglan, G.E. *Social indicators and societal monitoring: an annotated bibliography*. San Francisco: Jossey-Bass, Inc., Publishers, 1972.

Descriptors: indicators, attitude indicators, economic indicators, citizen participation indicators, electoral participation indicators, political indicators, social effects indicators, social impact indicators, social mobility indicators, social statistics indicators, values indicators

Location: R&D

APPENDIX D

Correspondence

1. Director, Human Resources
   Research Office
   300 North Washington St.
   Alexandria, Virginia 22314

2. Mr. Glen H. McLaughlin, Chief
   Personnel and Staff Services
   Texas D.P.S.
   Box 4087 N.A.S.
   Austin, Texas

3. Maj. General Gordon F. Blood, Commander
   12 Air Force
   Bergstrom Air Force Base, Texas 78743

4. Director, International Association of Chiefs of Police
   1319 18th St., N.W.
   Washington, D.C. 20036

5. The Office of the Governor
   State of Connecticut
   210 Capitol Ave.
   Hartford, Connecticut 01615

6. The Office of the Governor
   State of New York
   Eagle State and Washington
   Albany, N. Y. 12224

7. Office of the Governor
   State of Ohio
   State House
   Columbus, Ohio 43215

8. Office of the Governor
   State of Illinois
   State Capitol Complex
   Springfield, Illinois 61106

9. Office of the Governor
State of North Dakota
Bismark, North Dakota 58501

10. Office of the Governor
State of Michigan
Lansing, Michigan 48933

11. Office of the Governor
State of Wisconsin
Capitol Square
Madison, Wisconsin 53702

12. Office of the Governor
State of Oregon
Salem, Oregon 97310

13. Office of the Governor
State of Washington
Olympia, Washington 98504

14. Office of the Governor
State of California
Sacramento, California 95814

15. Office of the Governor
State of Colorado
200 East Colfax
Denver, Colorado 80903

16. The Office in Charge of Special Police Training
University of Kentucky at Louisville
Louisville, Kentucky 40208

17. The Office in Charge of Special Police Training
Northwestern University
Evanston, Illinois 60201

18. The Office in Charge of Special Police Training
Central Missouri State College
Warrensburg, Missouri 64093

19. Mr. Bill Wettington
Safeway District Manager
6101 North Hampton
Austin, Texas 78723

20. Mr. Tom Phillips
Personnel Director, Sears
Hancock Shopping Center
Austin, Texas 78751

21. Mr. Joe Bacon, Manager
Ramada Inn
5656 N. Interregional
Austin, Texas

22. Mr. Joe Riordian
Public Relations Division
Southwestern Bell Telephone
909 Colorado
Austin, Texas 78701

23. Mr. Floyd Hacker
Texas D.P.S.
P.O. Box 4087
Austin, Texas 78773

24. Mr. Lynn Anderson
Director of Conferences and Training
L.B.J. School of Public Affairs
Sid Richardson Hall, Unit 3, Room #3.13
Austin, Texas 78712

25. Mr. Warren Adkins
Texas Employment Commission
P.O. Box 160
Austin, Texas

26. Mr. C. Robert Woods
Plannet Associates
900 W. Koenig Lane #117
Austin, Texas

27. Mr. Mel McClinchie, Project Manager--Personnel
IBM Corporation
11400 FM Rd. 1325
Austin, Texas 78759

28. AIR
P.O. Box 1113
Palo Alto, California 94302

29. Dr. Terry Eisenberg
Research Scientist
Prof. Standards Division of IACP
11 Firstfield Rd.
Gaithersburg, Maryland 20760

30. Mr. Al Jones, Director, Adult Continuing Education
Texas Education Agency (TEA)
Brown Bldg., Room #209
Austin, Texas

31. Mr. James M. Patton, Chief
Training Dev. Branch
Civilian Personnel and Training Division
White Sands Missile Range, New Mexico 88001

32. Mr. Carl L. Hofer, Chief
Orientation and Training Branch
Bureau of Hearings and Appeals
HEW, South Bldg., Room #4118
330 C. Street, S.W.
Washington, D.C. 20201

33. Director, Regional Training Center
Philadelphia Region
U.S. Civil Service Commission
U.S. Custom House
Philadelphia, Pa. 19106

34. Director, Regional Training Center
U.S. Civil Service Commission
Atlanta Merchandise Mart
240 Peachtree St., N.W.
Atlanta, Georgia 30303

35. Director, Training Division
Naval Publications and Forms Center
5801 Taber Ave.
Philadelphia, Pa. 19120

36. Mr. Howard G. Baen, Director
Chicago Regional Training Center
U.S. Civil Service Commission
Main Post Office Bldg., Room #1311
433 West Van Buren St.
Chicago, Illinois 60607

37. Director, Internal Health Programs Systems Center
Tucson, Arizona 85701

38. Mr. Curtis Spencer, Director
Denver Regional Training Center
U.S. Civil Service Commission
Bldg. 20, Denver Federal Center
Denver, Colorado 80225

39. SSRC Center for Coordination of Research on Social Indicators
1785 Massachusetts Ave., N.W.
Washington, D.C. 20036

40. Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

41. Personnel Research Laboratory
Aerospace Medical Division
Lackland Air Force Base
San Antonio, Texas 78236

42. U.S. Army Engineer School
Fort Belvoir, Virginia 22060

43. Officer of Educational Research Lab.
Air Research and Development Command
Maxwell Air Force Base
Maxwell, California 36112

44. Department of the Navy
Naval Research Laboratory
Publications Office
Washington, D.C. 20390

45. Personnel Laboratory
Aeronautical Systems Division
Randolph Air Force Base
San Antonio, Texas 78148

46. Aerospace Medical Research Laboratories
Wright-Patterson Air Force Base
6570th Aerospace Wright-Patterson A.F.B.
Wright-Patterson, Ohio

47. Department of the Air Force
Headquarters--Pentagon
Publications Office
Washington, D.C. 20330

48. Department of the Army
Headquarters
U.S. Army Recruiting Command
Advertising and Information
Hampton, Virginia 23369

49. Continental Army Command
Fort Monroe, Virginia 23351

50. American Institute for Research
Arastradero St.
Palo Alto, California 94306

51. U.S. Army Southeast Signal School
Fort Gordon, Georgia 30305

52. ERIC Document Reproduction Service
P.O. Drawer O
Bethesda, Maryland 20014

53. U.S. Department of Commerce
National Technical Information Service
Springfield, Virginia 22151

54. Ms. Annette Goldreyer
1686 Moorings Dr.
Reston, Virginia 22070

55. DDC
Cameron Station
Alexandria, Virginia 22514

56. Air Force Human Resources Laboratory
Air Force Systems Command
Brooks Air Force Base, Texas 78235

57. Capt. Leslie G. Redmann
Bldg. 901, Room #316
Randolph Air Force Base
San Antonio, Texas 78148

58. American Educational Research Association
1126 16th St., N.W.
Washington, D.C. 20036

59. Harper and Row, Inc.
49 East 33rd St.
New York, N.Y. 10016

60. Longman Group Ltd.
74 Grosvenor St.
London WIX OAS, England

61. Public Personnel Association
1313 E. 60th St.
Chicago, Illinois 60637

62. Professor Robert Wood, Director
Harvard--MIT Joint Center on Urban Affairs
66 Church St.
Cambridge, Massachusetts 02138

63. Dr. Angus Campbell, Director
University of Michigan
Institute for Social Research
P.O. Box 1248
Ann Arbor, Michigan 48106

64. The Brookings Institute
1775 Massachusetts Ave., N.W.
Washington, D.C. 20036

65. Educational Innovators Press
Box 13052
Tucson, Arizona 85711

66. Russell Sage Foundation
230 Park Avenue
New York, N.Y. 10017

67. Dissemination Office
Center for the Study of Evaluation
UCLA Graduate School of Education
Los Angeles, California 90024

68. Center for Urban Studies
Wayne State University
Detroit, Michigan 48207

69. New York State Office of Planning Coordination
Albany, New York

70. National Opinion Research Center
University of Chicago
Chicago, Illinois 60637

71. Stanford Research Institute
Menlo Park, California

72. Albuquerque Urban Observatory
Albuquerque, New Mexico

73. Center for Urban Affairs
Northwestern University
Evanston, Illinois 60201

74. Office of the Assistant Secretary for Environment
and Urban Systems
U.S. Department of Transportation
Washington, D.C. 20590

75. Urban Research Group
School of Architecture and Environmental Studies
City College of the City University of New York
New York, N.Y. 10010

76. Wharton School of Finance and Commerce
University of Pennsylvania
Philadelphia, Pennsylvania 19104

77. American Institutes for Research
School of Education
University of Pittsburgh
Pittsburgh, Pennsylvania 15213

78. Holt, Rinehart and Winston
New York, N.Y.

79. Office of the Chief
Human Resources Research Organization
300 N. Washington St.
Alexandria, Virginia 22314

80. School of Education
Ohio State University
Columbus, Ohio 43210

81. System Development Corporation
Santa Monica, California

82. The Urban Institute
Washington, D.C.

83. School of Social Work
University of Michigan
Ann Arbor, Michigan 48104

84. American Sociological Association
1722 N. Street, N.W.
Washington, D.C. 20036

85. Dr. Byron E. Munson
Department of Sociology/Anthropology
Eastern Illinois University
Charleston, Illinois 61920

86. Center for Community Studies
P.O. Box 60
George Peabody College
Nashville, Tennessee 37203

87. Dr. David S. Alberts
c/o Praeger Publishers
Editorial Services
111 4th Avenue
New York, N.Y. 10003

88. American Management Association
135 West 50th St.
New York, N.Y. 10020

89. Department of Anthropology
Cornell University
Ithica, New York 14850

90. Institute of Labor and Industrial Relations
The University of Michigan
Ann Arbor, Michigan 48104

91. Dr. Paul Street
Dickey Hall, Room #63D
University of Kentucky
Lexington, Kentucky 40506

92. Science Research Associates
259 East Erie
Chicago, Illinois 60611

93. T. George Harris
Psychology Today
1330 Camino del Mar
Del Mar, California 90214

94. Addison-Wesley Publishing Company
Reading, Massachusetts 01867

95. Dr. H.S. Bhola
Indiana University
Bloomington, Indiana 47401

96. Spartan Books
1250 Connecticut Avenue, N.W.
Washington, D.C. 20036

97. Sylvania Electronic Systems
63 Second Avenue
Waltham, Massachusetts 02154

APPENDIX E

Site Visits Made by Project Team Members

The people who gave generously of their time and shared their thinking on training and evaluation were:

M. W. Wachs and William Rogers
Department of Housing and Urban Development
Community Planning and Management
Washington, D. C.
September 22, 1972

G. B. Martin, P.P. Mitchell and B. F. Cottingham
Southwestern Bell Telephone
San Antonio, Texas
November 1972

Nicholas P. Thomas
LBJ School of Public Affairs
University of Texas at Austin
Austin, Texas
December 4, 1972

Robert L. Dalglish
San Antonio College
San Antonio, Texas
December 18, 1972

Capt. L. G. Redmann, Col. Lee Young, Maj. F. P. Leuck,
Col. M. J. Rega, C. C. Cunningham, Maj. J. J. Blakey,
Lt. Blaine Lee, CMSgt. C. D. Elliott
Randolph Air Force Base
San Antonio, Texas
January 26, 1973

W. B. Mansfield, James Musick
Engineering Extension Division
Texas A&M University
College Station, Texas
January 30, 1973

P. E. Morgette and L. H. Courson
Personnel Department
City of Austin
Austin, Texas
March 1973

R. L. Dalglish and Dick Thiesen
San Antonio College
San Antonio, Texas
March 26, 1973

Harvey H. Johle, Collas Smelser
Personnel and Training
San Antonio Housing Authority
San Antonio, Texas
March 26, 1973

W. E. Driskill
Occupational Measurement Squadron
Lackland Air Force Base, Texas
March 27, 1973

Roy DeGaugh, J. W. Bowls, W. B. Lecznar
Joe Ward, Manuel Pina, Col. O. A. Berthold,
and Col. David Reingard
Personnel Research Division
Lackland Air Force Base, Texas
March 27, 1973

Collas Smelser
San Antonio Housing Authority
San Antonio, Texas
April 17, 1973

Murray Horowitz and Edgar Goff
Community University Research Associates
Boston College
Boston, Massachusetts
April 27-30, 1973

Richard Lavin
Merrimack Education Center
Boston, Massachusetts
April 27-30, 1973

Orville Hubbard, Mayor
City of Dearborn
Dearborn, Michigan
May 4, 1973

Anita Lux
Deputy Director
Service Bureau
City of Dearborn
Dearborn, Michigan
May 4, 1973

Marilynn Wacker
Assistant Executive Director
San Antonio Housing Authority
San Antonio, Texas
May 7, 1973

Harvey Johle, Collas Smelser
San Antonio Housing Authority
San Antonio, Texas
May 7, 1973

Collas Smelser
San Antonio Housing Authority
San Antonio, Texas
May 16-17, 1973

Reynold Blight
Manpower Analyst
Los Angeles Community Affairs Manpower
  Planning Survey (CAMPS)
Los Angeles, California
May 21, 1973

Ella Reid Bell
City Planner
Los Angeles Community Analysis Bureau (CAB)
Los Angeles, California
May 21, 1973

Marcia Madison and Charlene Groff
Evaluation Specialists
City Demonstration Agency
Evaluation & Information Unit
Los Angeles, California
May 21, 1973

Peter DeLeon
Rand Corporation
Santa Monica, California
May 22, 1973

Millicent Cox
Urban Information Studies Group
University of Southern California Computing Center
Los Angeles, California
May 23, 1973

A. W. McEachern
Youth Study Center
University of Southern California
Los Angeles, California
May 23, 1973

Joe Fink
Center for Urban Affairs
University of Southern California
Los Angeles, California
May 23, 1973

Robert Newman
Youth Studies Center
University of Southern California
Los Angeles, California
May 24, 1973

George Mandanis
Systems Applications, Inc.
Beverly Hills, California
May 24, 1973

Paul R. Christensen
Research Applications to Education
Santa Barbara, California
May 25, 1973

APPENDIX F

Demographic Items

Principles of Supervision

Age: ______

Sex: ______

Number of years of supervisory experience: ______

Number of people who work for you: ______

Population of community for which you work: ____________________

Type of work you supervise: ____________________

How many supervision courses have you had prior to this course? ______

In a typical day, what percent of the day do you spend on the following:

Planning/scheduling work __________

Coordinating/organizing work __________

Directing/controlling work __________

Training __________

Monitoring/checking/inspecting work __________

Dealing with technical problems __________

Dealing with personnel problems __________

Meetings with your supervisor __________

Meetings with your subordinates __________

Writing reports __________

Writing work orders __________

Principles of Supervision

A supervisor should (check the most important statements):

_____ spend most of his time inspecting work done.

_____ make sure employees understand company rules and policies.

_____ make company policy, when necessary.

_____ correct employees behavior in the presence of others if necessary.

_____ try to get other employees to handle his paper work.

_____ sacrifice quality work to get a greater quantity of work done.

_____ help employees to perform work when necessary.

_____ pass most problems "upstairs" for decisions.

_____ let someone else worry about how well trained employees are.

_____ stay out of the personal affairs of his employees.

_____ let someone else worry about the safe or unsafe working conditions.

_____ pick only the most skillful employees for overtime work.

_____ minimize the importance of gripes.

_____ interpret company policy to employees.

_____ encourage criticism of company policy, where appropriate.

Job Functions

The primary duties of a supervisor are (check the most important):

_____ checking work flow.

_____ inspecting quality of work.

_____ training employees.

_____ motivating employees.

_____ planning employee's work.

_____ coordinating employee's work.

_____ writing reports.

_____ doing employee's work.

_____ explaining his duties to employees.

_____ explaining his authority to employees.

_____ handling employee gripes.

_____ making procedural decisions.

_____ making company policy.

_____ committing funds.

_____ handling tools/equipment.

_____ setting company priorities.

_____ cooperating with superiors.

_____ inspecting working conditions.

_____ cooperating with employees.

_____ reducing waste.

_____ cooperating with the public.

_____ setting standards.

_____ giving complete instructions.

_____ evaluating company regulations.

Situation Number One

Joe is a drill-press operator in the shop. His work is simple, and he is paid on an hourly basis. He has always kept his output up and has never caused any trouble. For the past two weeks you notice that his production has been getting worse each day, while the production of the men around him remained steady. As his supervisor, you

(Put a plus (+) by the two things you would be sure to do and put a minus (-) by the two things you would be sure not to do.)

1. tell Joe to find another job.
2. talk to Joe's co-workers to determine why his production is down.
3. warn Joe that if his production doesn't improve you will fire him.
4. check with Joe's family to determine if everything is Okay at home.
5. talk with Joe about his performance.
6. talk with your supervisor about your problem with Joe's performance.
7. retrain Joe for another job.
8. invite Joe out for a beer to discuss how things are going in the shop.
9. encourage Joe to tell you of problems as soon as they arise.

Situation Number Two

As foreman, you are faced with a group of 14 employees who indicate they have some grievances; however, you refuse to call their shop steward and to talk to them as a group. Instead, you suggest that they appoint a spokesman. Before you leave, you threaten disciplinary action unless they are back at work in two minutes. When you return and find them still gathered, you ________

(Put a plus (+) by the two things you would be sure to do and put a minus (-) by the two things you would be sure not to do.)

1. tell all the men to clock out and then you will discuss their grievances with them.
2. tell all the men to clock out and go home; they are suspended for two days.
3. talk to the men about their grievances.
4. set up a time to meet with the men and then tell them to get back to work.
5. tell the men to go back to work; that you will talk with each man separately.
6. admit that the disciplinary threat was a mistake and promise to listen to their grievances first thing tomorrow morning.
7. pick the apparent leader of the group and chew him out right there.
8. pick the apparent leader of the group, fire him, and then threaten to fire anyone who is not back to work within two minutes.
9. tell the men to forget their grievances because management won't listen.
10. ask the men to choose a grievance committee of three to tell you their problem immediately and ask the other men to go back to work.

Situation Number Three

An employee, doubtful about following your instructions concerning a new method of loading a crane lift, consults his shop steward, who informs him that he does not have to do the job if he feels it is unsafe. As foreman, you

(Put a plus (+) by the two things you would be sure to do and put a minus (-) by the two things you would be sure not to do.)

1. go to the shop and chew out the employee for insubordination.
2. talk to the employee to try to find out why he thinks the new method is unsafe.
3. get someone else to load the crane lift.
4. chew out the shop steward for countermanding your instructions.
5. contact an industrial research group to determine the safety of the new method.
6. talk to your boss about the problem to find out what he would do.
7. try the new method yourself to determine how safe it is.
8. talk to both the employee and shop steward together to determine exactly what the problem is.
9. threaten the employee with disciplinary action if he doesn't do the job.
10. encourage the employee to communicate directly with you rather than indirectly through the shop steward.

Situation Number Four

Your superior calls for you to report to his office. As you walk in, it is obvious that he is busy. He hands you a new order, and says, "Take as many men off what they are doing and get this job out." The phone rings, he answers the phone and says, "Yes sir," gets up and walks out leaving you standing there. This is about the fifth time recently that he has failed to give you complete instructions. You decide that you should

(Put a plus (+) by the two things you would be sure to do and put a minus (-) by the two things you would be sure not to do.)

1. get to work, obeying his orders to the letter.
2. sit down and wait until he comes back so that you can get further instructions.
3. call in one of your leadmen and give him the same instructions.
4. go back to your office and hold the work order until you get the whole story.
5. write a memo to him which indicates how difficult it is to do a proper job without complete instructions.
6. begin getting the work done and then try to get the complete instructions.
7. call in a leadman and have him wait to get complete instructions from your superior.
8. send a memo to your superior's boss telling him about the poor instructions.
9. call in your leadmen and complain to them about how bad the situation is.
10. go after him, and demand that he fill you in on the details right then and there.

Situation Number Five

As supervisor, you have just spent considerable time planning the priorities of street repair work for your city. You are called into your superior's office at which time you are told of many complaints about unrepaired streets called in by citizens. You notice that these complaints are registered in areas you gave the lowest priority for work, which was based on analyzing the need, amount of work required, and the location. You decide that you should

(Put a plus (+) by the two things you would be sure to do and put a minus (-) by the two things you would be sure not to do.)

1. forget your plans and begin work on the areas complained about.
2. show your supervisor your plans and make a strong argument for following them.
3. ignore the complaints and follow your original plans.
4. ask your superior to help you replan the street repair priorities.
5. ask your superior to provide policies and guidelines covering street repair priorities.
6. do nothing until you receive specific orders regarding what areas should have priority for street repairs.
7. criticize your superior for not giving you the information sooner so that you could use the information in your planning.
8. ask your supervisor to make a decision about what streets should be repaired.

Situation Number Six

Your superior calls you into his office. He tells you that it appears that your men have not been performing their work up to standard in as much as he has received some complaints from customers. As a supervisor, you have carried out routine inspections of the work and found the quality to be acceptable. At this point you

(Put a plus (+) by the two things you would be sure to do and put a minus (-) by the two things you would be sure not to do.)

1. tell your boss that he does not have the facts.
2. try to determine what the problem is; what is specifically complained about.
3. ask your superior to come and inspect the work with you.
4. feel bad because of the reprimand suggesting that you haven't been doing a satisfactory job.
5. decide that you will have to spend considerably more time inspecting work.
6. decide that you will have to retrain the men to do better quality work.
7. go and chew out your men for their poor work.
8. decide to set higher quality standards for work.
9. ask to speak personally to the customers with complaints.
10. question other employees regarding the work of those considered unsatisfactory.

APPENDIX G

WORK SHEET FOR DALE-CHALL READABILITY FORMULA

Article:________________	Page No.______	Page No.______	Page No.______
Author:________________	From______	From______	From______
Publisher:________________	To______	To______	To______
1. Number of words in the sample....................	______	______	______
2. Number of sentences in the sample................	______	______	______
3. Number of words not on Dale list.................	______	______	______
4. Average sentence length (divide 1 by 2)..........	______	______	______
5. Dale score (divide 3 byl, multiply by 100).......	______	______	______
6. Multiply average sentence length (4) by .0496....	______	______	______
7. Multiply Dale score (5) by .1579.................	______	______	______
8. Constant...	3.6365	3.6365	3.6365
9. Formula raw score (add 6, 7, and 8)..............	______	______	______

Average raw score of ______samples .....________   Analyzed by______________________Date________

Average corrected grade-level ....______   Checked by______________________Date________

APPENDIX H

Background Information

Principles of Supervision

(Do not put your name on these sheets)

Age: ______

Sex: ______

How many years have you been a supervisor: ______

How many people work for you: ______

What kind of work do you supervise: ____________

How many supervision courses have you had before this course: ______

Principles of Supervision

A supervisor should (check the most important sentences):

____ spend most of his time checking work done by others.

____ make sure employees understand work rules and policies.

____ correct an employee in front of others if needed.

____ try to get other employees to do his paper work.

____ give up the quality of work to get a greater amount of work done.

____ help employees to do their work when needed.

____ pass most work problems "upstairs" for action.

____ let someone else worry about how well his employees are trained.

____ stay out of the personal affairs of his employees.

____ let someone else worry about the safety of working conditions.

____ pick only the best employees for overtime work.

____ pay no attention to gripes of employees.

____ explain city policy to employees.

____ cause employees to gripe about city policy.

Job Functions

In the list below, check those jobs a supervisor should do:

____ make sure work is done on time.

____ check finished work of employees often.

____ train clerk to use new office machines.

____ encourage secretaries to try to make fewer mistakes in typing letters.

____ arrange for machine repair ahead of time to lower the amount of worker down time.

____ arrange work to make sure the paper work gets done on time.

____ type finished copy of safety report to give to management.

____ explain the job of the supervisor in passing on gripes to management.

____ keep quiet about who arranges work and work plans.

____ pay no attention to employee gripes about noisy working places.

____ decide the steps to be followed in recording how money is spent.

____ decide that secretaries in his department can leave work 30 minutes early to miss rush hour traffic.

____ decide to buy a new kind of electric machine without checking with management.

____ unload trucks to help out workers.

____ decide to cut down trees along a street without asking management.

Job Functions (continued)

____ start new coffee break policy even though the management does not agree with it.

____ carry out regular check to find possible safety problems.

____ listen to and put to work secretaries' ideas to make work better.

____ answer questions that the public asks about changes in tax rates in a nice and careful way.

____ set work standards for his department.

____ check with new employees to make sure they have enough information to fill out personal leave requests.

____ gather facts for management about possible cost-savings by using new machines.

Situation Number One

Joe is a machine operator in a shop. His work is simple, and he is paid by the hour. He has always done his work well and has never caused any trouble. For the past two weeks you notice that his work output has been getting worse each day, while the work output of the men around him did not change. As his supervisor, you

(Put a plus (+) by the two things you would be sure to do and put a minus (-) by the two things you would be sure not to do.)

1. tell Joe to find another job.
2. talk to Joe's co-workers to determine why his work output is down.
3. warn Joe that if his work output doesn't improve you will fire him.
4. check with Joe's family to find out if everything is o.k. at home.
5. talk with Joe about his work output.
6. talk with management about your problem with Joe's work output.
7. put Joe on another job.
8. invite Joe out for a beer to talk with him about how things are going in the shop.
9. encourage Joe to tell you of his problems as soon as they arise.

Situation Number Two

As foreman, you are faced with a group of 14 employees who indicate they have some grievances, however, you refuse to talk to them as a group. Instead, you suggest that they appoint a spokesman. Before you leave, you threaten disciplinary action unless thay are back at work in two minutes. When you return and find them still gathered, you

(Put a plus (+) by the two things you would be sure to do and put a minus (-) by the two things you would be sure not to do.)

1. tell all the men to clock out and then you will discuss their grievances with them.
2. tell all the men to clock out and go home; they are suspended for two days.
3. talk to the men about their grievances.
4. set up a time to meet with the men and then tell them to get back to work.
5. tell the men to go back to work; that you will talk with each man separately.
6. admit that the disciplinary threat was a mistake and promise to listen to their grievances first thing tomorrow morning.
7. pick on the leader of the group and chew him out right there.
8. pick out the leader of the group, fire him, and then threaten to fire anyone who is not back to work within two minutes.
9. tell the men to forget their grievances because management won't listen.
10. ask the men to choose a grievance committee of three to tell you their problem and ask the other men to go back to work.

Situation Number Three

An employee, afraid to follow your instructions about a new method of loading a fork lift, talks to another supervisor who informs him that he does not have to do the job if he feels it is unsafe. As supervisor you

(Put a plus (+) by the two things you would be sure to do and put a minus (-) by the two things you would be sure not to do.)

1. go to the shop and chew out the employee for not following your orders.
2. talk to the employee to try to find out why he thinks the new method is unsafe.
3. get someone else to load the fork lift.
4. chew out the other supervisor for undercutting your job.
5. get an outside expert to say how safe the new method is.
6. talk to your boss about the problem to find out what he would do.
7. try the new method yourself to find out how safe it is.
8. talk to both the employee and the other supervisor together to find out exactly what the problem is.
9. threaten the employee with disciplinary action if he doesn't do the job.
10. encourage the employee to talk directly with you rather than take his problem to some other supervisor.

Situation Number Four

Your boss calls for you to report to his office. As you walk in, you can see that he is very busy. He hands you an unfinished work order, and says, "Take as many men as you need off what they are doing and get this job out." The phone rings, he answers the phone and says, "Yes sir", gets up and walks out leaving you standing there. This is about the fifth time in the past few weeks that he has failed to give you complete instructions. You decide that you should

(Put a plus (+) by the two things you would be sure to do and put a minus (-) by the two things you would be sure not to do.)

1. get to work, obeying his orders to the letter.
2. sit down and wait until he comes back so that you can get further instructions.
3. call in one of your workers and give him the same instructions.
4. go back to your office and hold the work order until you get the whole story.
5. write a memo to your boss that tells him how difficult it is to do a good job without complete instructions.
6. start the work and then try to get more complete instructions.
7. call in a worker and have him wait to get complete instructions from your boss.
8. send a memo to your boss's superior telling him about the poor instructions you get.
9. call in a worker and complain to him about how bad your boss is.
10. follow your boss and demand that he give you all the details right then and there.

Situation Number Five

As supervisor, you have just spent a lot of time planning the priorities of street repair work for your city. You are called into your boss's office at which time you are told of many complaints about unrepaired streets called in by citizens. You notice that these complaints come from places in the city that you gave the lowest priority for work. You decide that you should

(Put a plus (+) by the two things you would be sure to do and put a minus (-) by the two things you would be sure not to do.)

1. forget your plans and begin work on the streets complained about.
2. show your boss your earlier plans and make a strong case for following them.
3. ignore the complaints and follow your earlier plans.
4. ask your boss to help you replan the street repair priorities.
5. ask your boss to give you guidelines to set priorities for street repair.
6. do nothing until you receive direct orders about what streets should have priority for repairs.
7. gripe at your boss for not giving you the complaints sooner so that you would use them in your planning.
8. ask your boss to decide what streets should be repaired.

Situation Number Six

Your boss calls you into his office. He tells you that it looks like your men have not been performing their work up to standard, because he has received many complaints from citizens. As a supervisor, you have carried out weekly inspections of the work and found the quality to be good. At this point you

(Put a plus (+) by the two things you would be sure to do and put a minus (-) by the two things you would be sure not to do.

1. tell your boss that he does not have the facts.
2. try to find out what the problem is.
3. ask your boss to come with you and inspect the work.
4. feel bad because your boss says that you haven't been doing a good job.
5. decide that you will have to spend much more time inspecting work.
6. decide that you will have to train the men to do better work.
7. chew out your men for their poor work.
8. decide to set higher standards for quality of work.
9. ask to speak personally to citizens when they call in complaints.
10. question employees about who is not doing good work.

APPENDIX I

The Service Bureau of Dearborn, Michigan

The following information describes the service bureau which Mayor Orville Hubbard of Dearborn, Michigan, has instituted to handle citizen complaints. The system is presented because it offers a rather unique way to collect data on citizen complaints and to provide for follow through on the delivery of services to the citizen.

There is no question that the delivery of public and social services to citizens of the community is a prime function of government. The fact that services are not being rendered as effectively as they should be has given rise to the development of community development agencies at both the local, state and federal levels. If, as we have suggested elsewhere (Community Impact Evaluation), a system of citizen complaints and the intervening response time to achieve resolution of those complaints, can be accepted as an indirect measure of the quality of life in a community, then the Dearborn system should be examined carefully.

The maintenance of a quality service bureau in a community requires both a high degree of coordination among city departments, and a considerable amount of follow through. There is further little question that sustained and inspirational leadership to insure a delivery of services to citizens is a prime factor in the effective functioning of such a system. In the case of

Dearborn, Michigan, the mayor who has been in office for thirty-two years, provides the leadership and inspiration and the service bureau provide the necessary follow through on complaints received by citizens. The effective delivery of those services is achieved by means of a high degree of coordination among departments and by strong, effective leadership in the top executive position.

In addition to the forms and the internal organization of city departments in Dearborn, that will be presented in the material to follow, another important ingredient exists. The mayor has divided the city into districts. He has made each of his department heads responsible for a district. Each department head is required to tour his district at least once a week and file a monthly report with the mayor on the quality of life within his district. In this way the mayor receives direct information on the quality of life, the mobility of the population, the effective delivery of services, and is alerted early to potential problems. This surveillance and reporting technique provides additional information above and beyond the requests received and dispatched by the service bureau.

The Dearborn system provides a model which offers means of collecting data on community indicators. The following materials have been provided by the city of Dearborn. Acutal copies of complaints received and their disposition are presented as exhibits.

(information is to be typed here directly form the Dearborn material)

January 19, 1971

SERVICE BUREAU PROCEDURE

Almost all types of phone calls and requests are handled by this department. Thus, the poeple make only one call, saving the time of the individual being shifted back and forth. We take the call and give it to the proper department, division, or utility.

We write an order for each request or complaint, consisting of 4 copies. The Office Copy (white) is kept in an "Open File" until the yellow one is returned with a written disposition. Then the white copy is filled out with the disposition that was written on the yellow copy, stamped COMPLETED, and filed according to street address. The pink or Division Copy is kept by the department who did the work. When the work is completed, the department sends back the yellow copy with a written disposition on it. The Director of the Service Bureau reads each yellow copy to see that each has been completed, initials it, and then the white copy is pulled from the "Open File" as stated above. The Service Bureau's or yellow copy is used as the backbone for making the business reply cards. The business reply card is sent to each caller in order to determine whether the work was done satisfactorily or not. After the business reply cards have been sent, a personal permanent index card is made on each caller and filed according to their last name in our permanent file. This way we have a record of each call that comes into this department. The Director's Copy (gold) is filed--after the Director reads it to determine whether prompt action is required--according to the department and the category of work being done.

The following types of calls would be sent to the following departments:

VECTOR CONTROL : receives calls on any animal situation outside or inside the home in the case of squirrels, bats, rats, mice, bees, wasps, hornets, ants, bugs of any sort. Also handles problems concerning pigeons and poison ivy.

DOG POUND : takes all dog and cat complaints, and picks up dead animals of any kind.

HEALTH : takes calls on unsanitary conditions INSIDE the home or building, and unhealthful food conditions in restaurants, stores, or business places.

PARKS & BLVDS. : takes care of all city trees; trimming, removing, repairing, spraying, and inspection of same. Also gives advice to residents on private trees. Tree stumps are removed within a month after the city tree has been removed. They also pick up branches, shrubs, and even entire trees that have been cut by the residents themselves--although there may be a charge of which the caller is informed. If the work was done by a contractor, the contractor must take it away.
Also takes care of city parks, weed cutting in vacant lots, and lawns damaged by snow plows. In the winter, it handles the plowing of snow from sidewalks. Parks & Boulevards is divided into two sections--East & West--each end of town taking care of its own calls.

HIGHWAYS : picks up broken concrete, rocks, bricks, lumber, dirt, clay sod, clothespoles, garage doors, storm windows & screens, and any other article which cannot be picked up by the regular Sanitation truck except for large appliances and furniture. It also takes care

of street maintenance (cleaning, sweeping, patching), slagging of alleys, cleaning & checking of sewers and catch basins; and, in the winter months it handles the plowing of snow from the streets and paved alleys. Calls concerning flooded basements are sent to this department so that city lines can be checked and advice can be given to the resident.
Charges are sometimes given on excessive amounts of debris and the caller is notified of this.

SANITATION : picks up all garbage and rubbish weekly--each area having a particular day. Grass clippings, leaves, should be in containers and picked up on regular pickup days. A special pickup is required for carpeting (unless it is cut into 4 foot long rolls and tied), furniture, and heavy appliances which is then forwarded to Mr. Burich for pricing. Sanitation also handles complaints for burning rubbish, or untidy alleys, damaged trash cans, and complaints regarding pickup men.

BUILDING & SAFETY : takes inspection of run-down buildings--houses, garages, etc. They check violations of residential zoning; repairing cars on street, driveways, or in garages. Also checks on ill-kept yards, vacant homes, disputes over fences or eyesores. One of their check-chief duties is inspection of all buildings during construction for their permits, etc. Complaints regarding odors or smoke in the air is handled by them. Especially those concerning incinerators. Heating problems go to Mr. Horschak.

ENGINEERING : takes care of all sidewalks and curbs done by the City or by Contractors--handles all construction work done in the City.

PUBLIC WORKS : handles calls pertaining to the plowing of lots (privately owned) and the planting of new trees on city property. All these calls are transferred to DPW.

PUBLIC SAFETY : handles stop signs, yield signs, etc. They are approved by Lt. Lindsey at the Police station and then sent to

Parking Meters for installation.

TRAFFIC SAFETY : handles complaints on high hedges obstructing view of drivers, and larger signs for traffic safety.

PARKING METERS : handles repair or replacement of street signs, church signs and direction signs, as well as street cleaning signs. Officers also inform store owners to clean litter from around their establishment.

POLICE : handles requests for the installation of signs, complaints regarding cars parked on the street, shopping cart complaints, excessive noise, large trucks blocking traffic, abandoned autos, as well as complaints where immediate action is required.

PUBLIC UTILITIES & TRANSPORTATION handles the repairing of street lights and telephone & gas company problems by notifying companies responsible. Also takes care of complaints on bus shelters and issues bus passes for Senior Citizens.

MAINTENANCE : handles the repairing of lawns after they have been damaged by city snow plows and repairs city fences, as well as other repairs needed on city property or in city buildings.

LEGAL or CORPORATION COUNSEL : handles all legal problems and consults with citizens on legal matters pertaining to written complaints & suits. Also handles complaints on residents receiving literature from businesses when their homes are posted with "No Handbills or No Soliciting" signs.

SIGNAL BUREAU : handles complaints on operators and street traffic lights that are not working properly.

WEIGHTS & MEASURES : handles complaints of large trucks going down residential streets posted with "No Commercial Vehicles" signs. Also handles inspection of scales in business establishments.

MAYOR'S OFFICE : handles all complaints on Camp Dearborn and many suggestions made by residents.

FIRE DEPARTMENT:	handles complaints having anything to do with the health, welfare, or safety of individuals within the City of Dearborn, but these are usually referred to Fire Dept. from Building & Safety. Also takes care of fire hydrants.
COMMUNITY DEVELOPMENT:	handles complaints on sub-standard homes in the south end of Dearborn and also handles Eugene and Porath homes. Also takes care of any complaints made on the house demolition crew working in the South end of Dearborn.
CITY PLAN :	handles complaints on demolition crews working on homes in the east and west end of Dearborn. Also handles the closing of alleys.

At the end of each day, a 3 x 5 card is typed totaling the number of written requests and are listed by department in this order: Sanitation, West Parks, East Parks, Highways, Building & Safety, Engineering, and Miscellaneous (which includes any requests sent to departments other than those listed in the above) with the total of requests made to each department listed.

About the 15th of each month, a report is made for each department listed if there are any requests that are past-due (those which have not been completed within a month). This is typed in duplicate and signed by the director and then one copy is forwarded to the department involved while one copy is kept in this office. The departments acknowledge these and forward them back with notifications as to whether the work has been done or not with the date of completion.

If everyone will sweep his own d[illegible]p, the whole world will be clean.

To Mayor Hubbard: Date

4-13-73 #77117 vg

The recent attention I received from the Service Department was:

Re: Replaced City tree 4-16-73/anita/rice-vigilante/e. parks

☒ Satisfactory ☐ Unsatisfactory **Suggestions**

Thanks for the good service

Name Alfreda Zalewski (PLEASE PRINT) Age 67

Address 7524 Appoline Phone Tu 1-3964

Mrs. Stanley Zalewski - 7524 Appoline 26 - IU 1-3964

ZALEWSKI, Stanley J. ('73-67) Alfreda A.
7524 Appoline 26 IU 1-3964

"SAMPLE PERSONAL CARD - for Senior Citizen"

7-23-68	#00167	Pick up guinea pig/sb
7-23-68		Picked up stray hampster/dawdy/al
11-27-68	#06485	Trim tree/lh
2-24-69		Trimmed tree/rice-asplundh/al
6-11-69	#13426	Check dying tree/cd
6-12-69		Tree showing signs of D.E.D. Explained that if tree gets worse, we will remove/broda/al
7-29-69	#16895	Remove diseased tree/al
9-5-69		Removed tree & stump/rice-ciccarelli/al
10-12-72	#68421	Check new tree/al
10-12-72		Checked & advised, minor damage. She will call back in Spring/rice/al

(over)

7

DATE 4-13-73

TIME 10:38 :

It Takes Teamwork To Get Things Done

REQUEST FOR SERVICE

SERVICE BUREAU

WHITE - OFFICE COPY
YELLOW - SERVICE BUREAU'S COPY
PINK - DIVISION'S COPY
GOLD - DIRECTOR'S COPY

№ 77117

PARTY CALLING Mrs. Stanley - Zalewski ADDRESS 7524 Appoline 26 ZIP PHONE LU 1-3964

NATURE OF REQUEST Last year the city removed a tree next door to her and in the process, we damaged her young city tree. The foreman who checked her tree last year told her that if she wasn't satisfied with it, we would replace the tree. Please check young tree and see if it needs replacing and if we will replace it.

TAKEN BY anita

DISPOSITION Replaced tree.

CALLED IN TO

REFERRED TO

Sanitation ☐ East Parks ☒
West Parks ☐ East Highways ☐
West Highways ☐ Bldg. & Safety ☐
☐

DATE PARTY NOTIFIED OF DISPOSITION ________ PARTY'S COMMENT: Satisfactory ☐ Unsatisfactory ☐

SIGNED Rice/Vigilante DEPARTMENT Parks DATE 4-16-73

USE REAR OF SHEET FOR FURTHER COMMENT

UW

PARTY CALLING ________ ADDRESS ________ ZIP PHONE ________

NATURE OF REQUEST ________

TAKEN BY ________

DISPOSITION [illegible] – Carol
4-13-73

Replaced tree

CALLED IN TO

REFERRED TO

Sanitation ☐ East Parks ☐
West Parks ☐ East Highways ☐
West Highways ☐ Bldg. & Safety ☐
☐

DATE PARTY NOTIFIED OF DISPOSITION ________ PARTY'S COMMENT: Satisfactory ☐ Unsatisfactory ☑

SIGNED Rice / Vigilante DEPARTMENT PB DATE 4/16/73

USE REAR OF SHEET FOR FURTHER COMMENT

Stan Hughes
12 April 1973

MONTHLY DISTRICT REPORT : Area bounded on the North by the South side of Ford Road, on the East by the West side of Wyoming, on the South by the North side of Michigan, and on the West by both sides of Orchard

COKE SIGNS : Total--9

HOUSES FOR SALE : Total--17 (total last month 7)

5537-5539 Calhoun (Owner) *

5238 Reuter (Matuszewski)

5452-5454 Calhoun (Sassanelli)

5100 Neckel (Owner) *

5458 Maple (Owner)

5238 Maple (Christie)

5034 Maple (integrity) *

4883 Maple (Fordson)

5218 Horger (Dearborn)

5264 Middlesex (Forbush)

5473 Williamson (Vincent Nee)

5489 Williamson (Garling New home) *

4811 Argyle (Earl Kein)

5018 Kenilworth (Garling)

5131 Kenilworth (Real Estate One)

4760 Roemer (Leslie)

4746 Chase (Owner) *

DAMAGED SIGNS : Total--6

Sent #77111 to P.M. on 4-12-73/al 1,2,3,&4 REFERRED TO COUNTY 5&6 REPAIRED/4-13-73/ walerych/dm

Ford Road, Eastbound at Wyoming "This Lane Must Turn Right" sign down (State Highway Sign)

Wyoming, Southbound at Michigan damaged "US 12" sign (State Highway Sign)

5408 Reuter, sign pole bent

4798 Williamson, sign pole bent

PRIVATE PARKING LOTS THAT NEED CLEANING : Total--2

Sent #77112 to B&S on 4-12-73/al

Club Chablis, 12900 Michigan, rear lot

Diamond Jim's, Northeast corner of Michigan and Hartwell

HOLES IN ROAD : Total--1

Sent #77113 to E. Highways on 4-12-73/al

Schaefer, Southbound, Colson to Michigan

JUNK CARS IN YARD : Total--2

5402 Argyle

Sent #77114 to Auto Squad on 4-12-73/al OFFICERS TALKED TO JOYCE HUNT, 582-3329, 5416 ARGYLE, WHO STATED THAT THE VEHICLES WOULD BE REMOVED AS SOON AS POSSIBLE. CAR-3 4-15-73 HARWORTH & MELTZER/4-16-73/al

NO BUILDING PERMITS DISPLAYED :	Total--2
Sent #77115 to B&S on 4-12-73/ al VIOLATION ISSUED TO 5101 KENDAL. PERMIT ISSUED FOR 5121 JON THON--NO WORK STARTED. /kemp 4-13-73/al	5101 Kendel 5121 Jonathon
STATE LAND THAT NEEDS TO BE CLEANED OF LITTER :	Expressway area, Michigan Avenue from Wyoming to Miller
Sent #77116 to City Beautiful 4-12-73/al	